Nikon FM

ニコン FM

REPAIR MANUAL

修 理 指 針

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Tokyo, Japan

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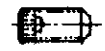
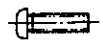
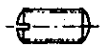
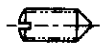
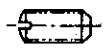
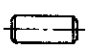
1. Marks in the parts list 記号説明

(1) Standard mechanical elements 標準機械要素

Mark 記号	Shape 形状	Name 名称	Mark 記号	Shape 形状	Name 名称
JCIS ⊕ PM		JCIS Pan Head Machine Screw JCIS十字穴付きなべ小ねじ	HS		Hexagon Socket Head Set Screw 六角穴付き止めねじ
JCIS ⊕ CM		JCIS Countersunk Head Machine Screw JCIS十字穴付きさら小ねじ	HSB		Hexagon Socket Head Bolt 六角穴付きボルト
JCIS ⊕ OCM		JCIS Oval Countersunk Head Machine Screw JCIS十字穴付き丸さら小ねじ	(45°)P		Oval Countersunk Head Special Machine Screw すりわり付き特殊丸さら小ねじ
⊕ PM		Pan Head Machine Screw 十字穴付きなべ小ねじ	(45°)Q		Countersunk Head Special Machine Screw すりわり付き特殊さら小ねじ
⊕ CM		Countersunk Head Machine Screw 十字穴付きさら小ねじ	⊕ PTB		Pan Head Tapping Screw Type B 十字穴付きなべタッピンねじB
⊕ OCM		Oval Countersunk Head Machine Screw 十字穴付き丸さら小ねじ	⊕ CTB		Countersunk Head Tapping Screw Type B 十字穴付きさらタッピンねじB
⊕ RM		Round Head Machine Screw 十字穴付き丸小ねじ	⊕OCTB		Oval Countersunk Head Tapping Screw Type B 十字穴付き丸さらタッピンねじB
⊕ TM		Truss Head Machine Screw 十字穴付きトラス小ねじ	⊕ PT		Pan Head Tapping Screw 十字穴付きなべタッピンねじ
SR		Set Screw Round Point すりわり付き止めねじ丸さき	⊕ CT		Countersunk Head Tapping Screw 十字穴付きさらタッピンねじ
SC		Set Screw Cone Point すりわり付き止めねじとがりさき	⊕ OCT		Oval Countersunk Head Tapping Screw 十字穴付き丸さらタッピンねじ
SH		Set Screw Half Point すりわり付き止めねじくぼみさき	N		Hexagon Nut 六角ナット
TP		Taper Pin テーパピン	SPP		Spring Pin スプリングピン
STP		Straight Pin 平行ピン	E		E-ring E型止め輪

Expression 表 示 法

☆ Standard screw 標準ねじ

Mark, Diameter × Pitch × Length, Type or Mark, Diameter × Length, Type
記号 ねじの呼び径 ピッチ 長さ 種別 又は 記号 ねじの呼び径 長さ 種別

Ex. ⊕ RM 3×0.5×4 JCIS ⊕ PM 2×2.5 Type (3)

☆ Pin ピ ン

Mark, Diameter × Length
記号 呼び径 長さ

Ex. TP 2×12

☆ Nut ナ ッ ト

Diameter of internal thread, Mark-Type
ねじの呼び径 記号 種別

Ex. 8 N-Type (3)

☆ E-ring E型止め輪

Mark-Diameter
記号 呼び径

Ex. E-8

(2) The term of sale column 販売区分欄

Mark 記号	Explanation 説明	
○	Can be supplied individually	単独部品として販売するもの
△	Not supplied individually but only as subassembly	部組品でなければ販売しないもの
○△	Supplied either as part or subassembly	単独部品でも部組品でも販売するもの
×	Not considered as repair part	修理部品とは考えないもの
※	Should be sent to the factory if the repair is needed	単体では交換できないので、組む場合に工場での加工が必要なもの
◙	Delivered as a product from the sales department (i.e., not supplied as repair part)	商品として販売店で販売しているもの (修理部品扱いはしない)

(3) The remarks column 備 考 欄

S-0001	Part number used in common	共通部品番号
D-2222	Part number in stock	貯蔵品番号
51F1001	Technical data sheet number	製品技術資料番号
-1×100/1000	Starting order	実施オーダー
Rev.	Revision	訂 正
Add.	Addition	追 加
Dis.	Discontinuation	廃 止
#1-#3	Relative parts number	関係部品番号

2. Lubricant and binding agent list 潤滑剤・接着剤一覧表

LUBRICANTS 潤滑剤

Oil 油	Usage 用途	Items number 番号	Items 商品名 Japanese 日本	Remarks 備考
Liquid oil 液体油	At a normal temperature 常温用	L 1212	日本石油 スピンドル油 No.5	
		L 1233	シエル石油 トナオイル #33	
		L 1309	モービル石油 モービルーブ HD80—90	
		L 1314	モービル石油 モービルーブ HD140	
	At a low temperature 低温用	L 2010	ウイリアム・エフ・ナイ(木村産業) アストロオイル	
		L 2113	三建化工 D.O.S	
		L 2215	エクリプス・パイオニア エクリプス・パイオニア #10(ジャイロ油)	
		L 3016	理研製油 スクワレル LA—10	
		L 3025	理研製油 スクワレル M—1	
		L 3034	理研製油 スクワレル M—2	
		L 3044	理研製油 スクワレル M—5	
		L 3047	理研製油 スクワレル H—1	
Grease oil グリース	At a normal temperature 常温用	G 5201	社内調合	
		G 5204	社内調合	
		G 5214	社内調合	
		G 6053	日本鉱油 パーマルブ H1003	
		G 6252	出光興産 ダフニコロネックス 2	
		G 6372	シエル石油 シエルアルバニア 2	
		G 6414	杉浦研究所 光学用グリース Z—2	
		G 6433	杉浦研究所 光学用グリース X—2	
		G 7821	丸善石油 リマックス 2	
		G 8681	ロックレー(大東商事) リキモリオート LM—81	
	At a low temperature 低温用	G 7100	理研製油 スクワグリース L—2	
		G 7811	日本鉱油 フォートルブ 024	
		G 7812	日本鉱油 フォートルブ 025	
		G 7813	社内調合	
		G 7814	協同油脂 マルテンプPS No.1	
		G 7815	協同油脂 マルテンプPS No.2	
		G 7833	東レシリコーン シリコーンSH.33(F)グリース	
		G 7848	日本石油 ユニテンプグリース	
		G 7854	日本鉱油 パーマルブ C—1	
		G 7855	日本鉱油 パーマルブ C—2	

LUBRICANTS 潤滑油

Oil 油	Usage 用途	Items number 番号	Items 商品名 Japanese 日本	Remarks 備考
Grease oil グリース	At a low temperature 低温用	G 7856	日本鉱油 パーマルブ C－3	
		G 7862	日本鉱油 パーマルブ F－2	
		G 7866	日本鉱油 フォートルブ #023	
		G 7870	モービル石油 モービルグリース 27	
		G 8181	社内調合	
		G 8610	ロックレー(大東商事) リキモリブースター LM－83	
		G 8613	ロックレー(大東商事) リキモリパウダー LM－13	

BINDING AGENTS 接着剤

Usage 用途	Items number 番号	Items 商品名 Japanese 日本	Remarks 備考
For leather or rubber goods. 皮類，ゴム類	# 330	スミボンド VA－1000	
	# 501	プライオボンド #30	
For make metal goods together with metal goods or glass with metal 一般金属相互 ガラスと金属	# 616	セメダインスーパー (家庭用) セメダイン#1500 (工業用)	
	# 621	セメダイン#1565	
	# 631	アラルダイト AT1	
	# 634	主剤 アラルダイト AY 101 硬化剤 ハードナー HY 951	
	#645HB, #645HE	DM K5	
For temporary adhesion in the process 工程上の仮止め	# 201	セラック オレンジ色，レモン色可	
	# 350	ねじロック	
	# 410	ロックタイト (B/M黄，ST/L赤 SC/L紫，N/L青，D橙	
	# 921	アロンアルファ # 201	
	# 922	アロンアルファ # 202	
For replenishment 充填を主とする接着	# 503	ウェザーバンシーラー	
	# 506	スリーボンド No.4	
	# 508	シラシール 3DW	
	# 512	シラシール FSXS－1548	
	#646HB, #646HE	DM D6	
	#647HB, #647HE	DM K3	

3. PARTS AND SUBASSEMBLY LIST

Page

Parts list ..... 5 — 27

Subassembly list 28

Note: These lists give the numbers of the drawings to be refered to identify the shapes of the parts, subassemblies and their positions in which they are used.

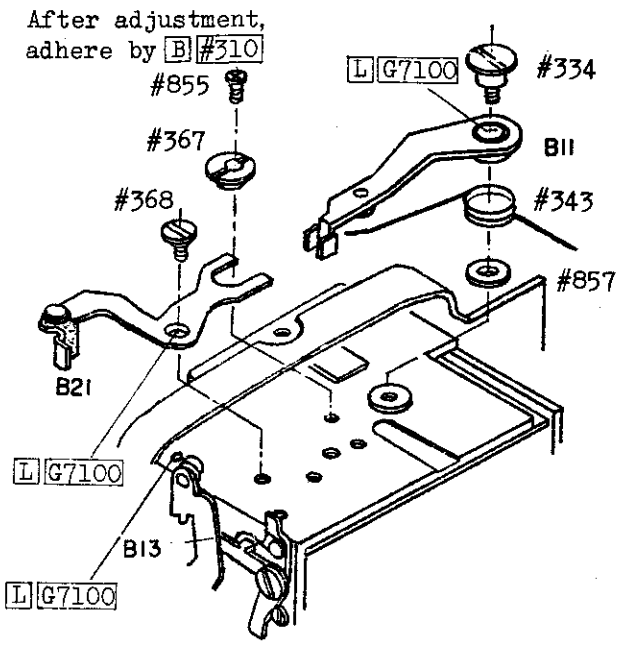
These lists cover only the parts and subassemblies available for repairing. Please make sure of the numbers of the parts and subassemblies, referring to the succeeding Exploded Drawings and Parts List.

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
9	Eypiece glass clip 接眼ガラス押えバネ	1	1	32FB-#392	
10	Tripod socket 三脚座	1	14		
13	Sync socket cap ターミナルキャップ	1	6	32FB#15A	
15	Sync socket シンクロソケット	1	6	S-8504	
26	Blank shot check lever 空撮り防止レバー	1	13		
28	MD signal lever axle MD信号レバー軸	1	13		
29	Collar 空撮り防止レバー軸カラー	1	13		
30	Spring MD信号レバーバネ (d=0.26)	1	13		
31	Bottom retaining plate 底部押え坂	1	14		
39	Shoulder cover, right 前板右肩カバー	1	9		
40	Shoulder cover, left 前板左肩カバー	1	9		
46A	Battery chamber label 電池貼マーク	1	14		
	電池ホルダー	1	14		
50	Roller ローラー	1	16		
51	Roller shaft ローラー軸	1	16		
52	Lead wire cover コード溝カバー	1	13		
53	Front plate hole cover 前板孔カバー	1	9		
54	Self-timer lever screw セルフレバービス	1	9		

Part No. 部品番号	Name 名称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備考
55	Self-timer lever leatherette セルフレバー用皮	1	9		
56	Body leatherette A ボデー擬革A	1	16		
57	Body leatherette B ボデー擬革B	1	16		
58	Groove tightener A 溝用モルトプレン	1	16		
58A	Top groove tightener A 上溝用モルトプレン	1	16		
58B	Top groove tightener B 上溝用モルトプレンB	1	16		
59	Mirror box bottom sponge ミラーボックス下部モルト	1	11		
60	Etepiece bottom light-tight 接眼下部遮光モルト	1	13		
61	Mirror-up cushion sponge ミラーアップ受モルト	1	9	32FB-#345	
62	Shutter top cover シャッター上カバー板	1	13		
63	Shutter cushion rubber シャッター羽根受けゴム	1	13		
64	Shock abscrb rubber A 緩衝ゴムA	1	14		
65	Shoulder screw 前カバー用段ビス	1	8		
69	Shoe switch contact, upper 押え接点	1	1	31F3B-#571	
70	" , lower 受接点	1	1	31F3B-#572-1	
71	Collar Dカラー	1	1	31F3B-#573	
72	Contact washer 接点座金	1	1	31F3B-#574	
73	Switch plunger 押棒	1	1	31F3B-#575	

Part No. 部品番号	Name 名称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備考
74	Shoe washer シュー座金	4	1	31F3B-#576	
76	Sync socket nut シンクロ接点ナット	1	1		
78	Penta-prism cover leatherette ペンタ革	1	1		
79	Baffle plate 緩衝板	1	14		
80	Frcnt plate hole cover 前板穴カバー	1	9		
81	FRE insulator FREシート絶縁	1	1		
82	Shutter light-tightener シャッター遮光モルト	1	13		
83	Mirror box rear light-tight ミラーボックス後部モルト	1	9		
84	Light tight spong 遮光押えモルト	1	13		
85	Charge lever rubber シャッターチャージレバーゴム	1	14		
87	Retaining tape コード押えテープ	1	9		
100	Shutter シャッター	1	13		
103	Bypass capacitor バイパスコンデンサー	1	7		
104	FRE resistor FRE用抵抗	1	7		
105	FRE variable resistor FRE用調整抵抗	1	7		
106	FRE variable resistor FRE用調整抵抗	1	7		
107	Latch cutoff resistor A ラッチ防止抵抗A	1	7		
108	Latch cutoff diode ラッチ防止ダイオード	1	7		

⑱ Reassembly of front plate (charge lever, mirror-up lever, middle lever)



Front plate (#6)

↓

Mirror down lever adjuster B21, ⊖#368

↓

Down lever eccenter #367, ⊕#855

↓

Mirror charge lever B11, down lever spring #343, mirror charge lever axle #334

↓

Brake spring base #285

↓

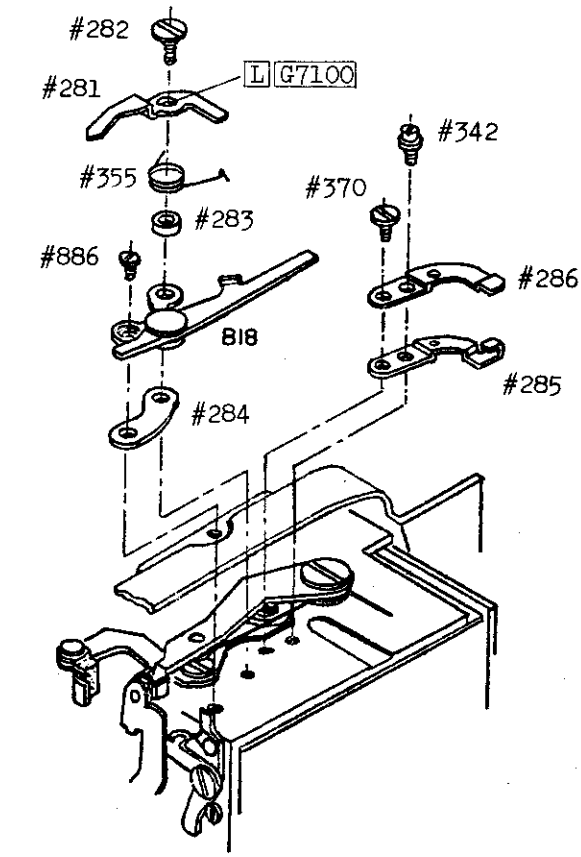
Brake spring #286, ⊖#370×1, middle lever stopper #342

↓

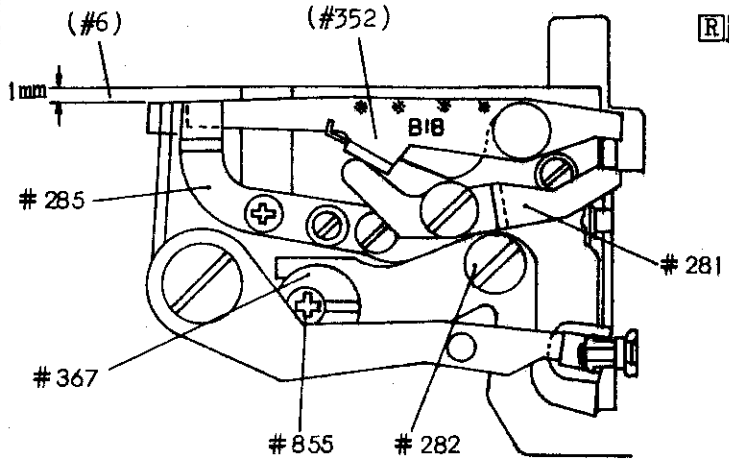
Middle lever base plate B18, washer #284, ⊖#886×1

↓

Brake release lever #281, collar #283, spring #355, ⊖#282×1

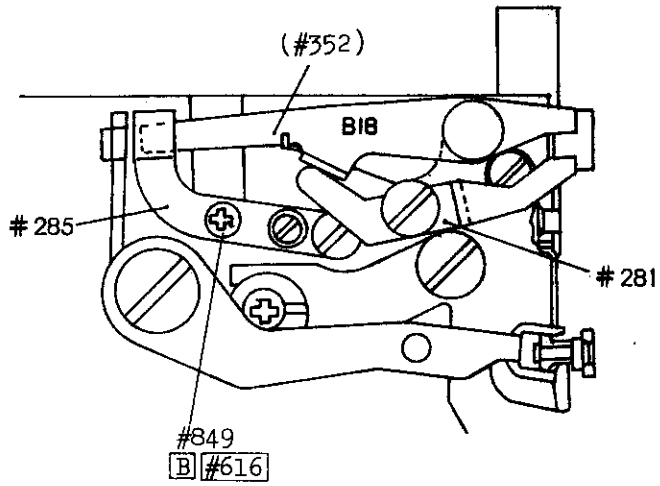


⑲ Attaching of 2nd curtain brake



[R][A] Attach B18 in such a psition that its straight edge marked with ※-※-※ is parallel to the end surface of mirror box B. (Distance between (#352) and the end surface of mirror box is to be about 1mm.)

After shutter released



[C] After shutter releasing, B18 should be braked by #285 and #286.

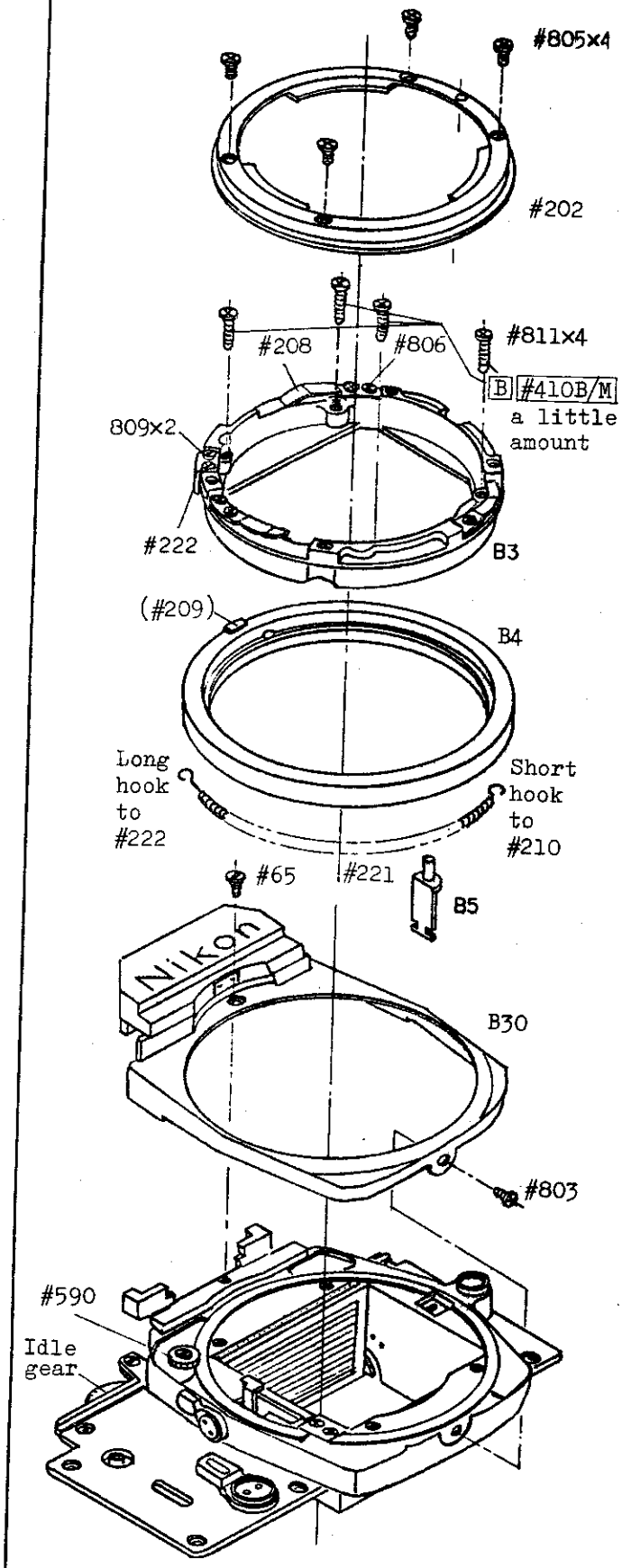
•2nd curtain brake mechanism

MD wind-up signal middle lever being brought between brake base plate and brake spring, movement of signal lever is braked to prevent noises caused by 2nd curtain.

[A] Releasing the shutter several times, make adjustment of spring pressure so that the deepest engagement is obtained between (#352) and #285 (with #286), by means of screw #849.

[B] After adjustment, adhere the screw head firmly in position with [B][#616].

⑳ Reassembly of aperture coupling ring



Front cover, ⊖#65×1, ⊕#803×1

↓

Lens release lever B5

↓

Aperture coupling ring

R Hang longer hook of spring #211 on #222, and shorter one on #210.

↓

Lens mount, ⊕#811×4

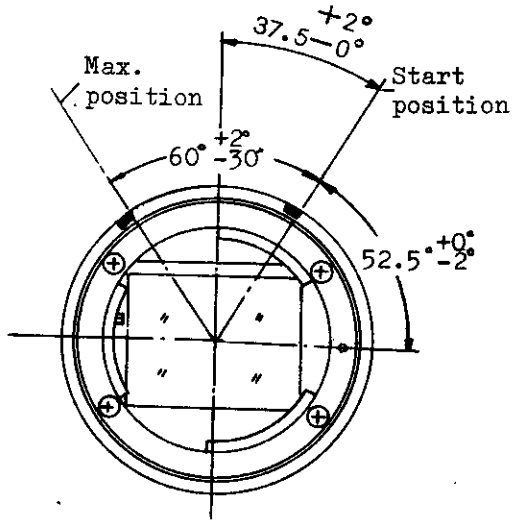
R Fasten up aperture coupling ring in its most smoothly rotating position.

↓

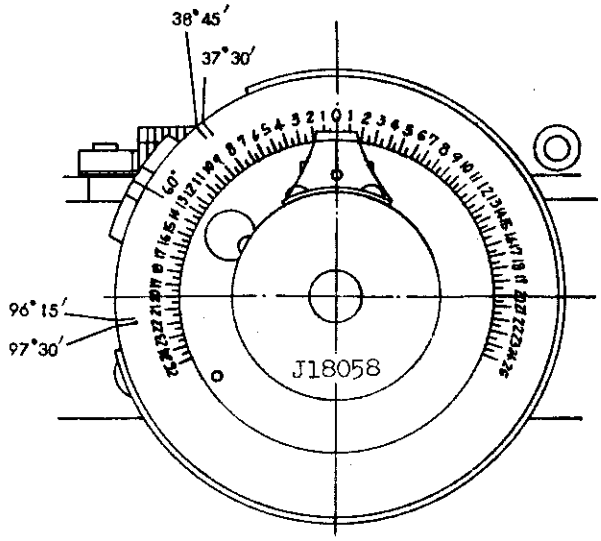
Bayonet ring, ⊕#805×4

C After reassembly, check for correct torques at the start and the max. rotating position of coupling piece(#209). For measuring methods, refer to paragraph ㉑ .

Specified angles:

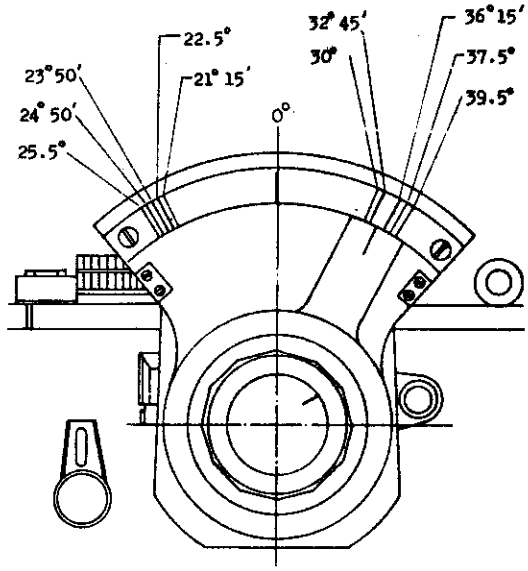


㉑ Measuring methods of angular positions of aperture coupling piece

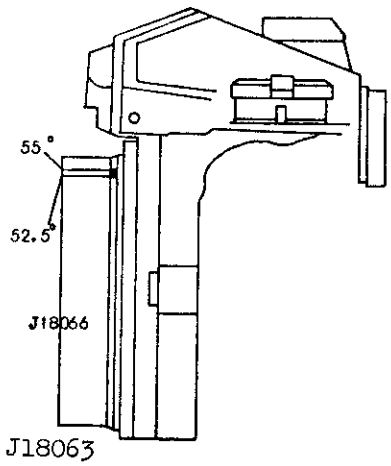


Specified angles:
At start position ..... 52.5° $\pm^{0}_{2}$°
At max. rotation ..... 112.5°
Specified torque ... Within 350g·cm

•Method by AI click torque meter J18058
Attach the meter to camera bayonet, and make measurement by means of marked-off lines on the meter.



•Method by coupling piece torque meter
Settling claw (fork) of the meter on coupling piece, and attach the meter to camera bayonet. Make measurement by means of marked-off line (52.5°) on the meter.



•Method by AI F-figure field check gauge J18063 (For angle only)
Attach the gauge to camera bayonet, and make measurement by means of marked-off lines (52.5°and 55°) on the gauge.

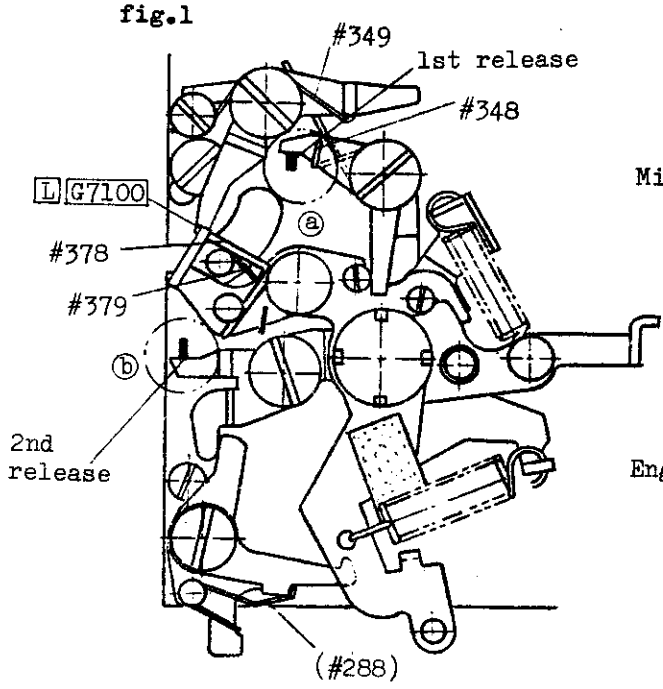
[A] If any deviation is found, make adjustment by shifting coupling piece stopper #222.

[N] The torque is to be measured in the direction in which coupling piece returns to its original position.

㉒ Reassembly of mirror box to body

Left-hand side view of mirror box

fig.1



Body

↓

Mirror box, ⊕#817×1, ⊕#810×5

Ⓝ Keeping shutter charged, release blank shot check lever, and the halfway wind-up position will be obtained.

Ⓝ (1) Associated parts with mirror box are to be set to charge position.
(2) All perts are to be assembled to engage as shown in fig.1—3. (See engaging part ⓐ — ⓔ)

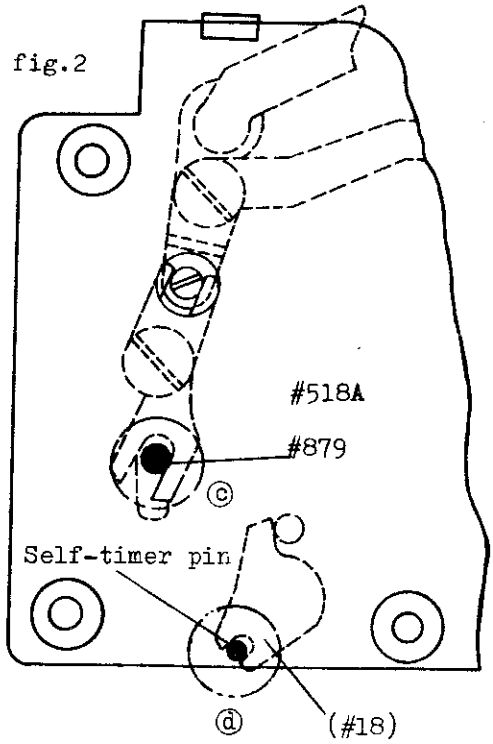
Engaging part—
- ⓐ Shutter release lever #321 to 1st release
- ⓑ Signal lever #328 to 2nd release
- ⓒ Release lever fork #518A to release lever guide pin #879
- ⓓ Self-timer coupling lever (#18) to self-timer pin
- ⓔ MD wind-up middle lever (#352) to MD signal pin (#27).

Ⓡ Start fastening-up of screws from ⊕#817×1.

Ⓒ After assembly, make sure of positive operations of mirror, wind-up lever and shutter.

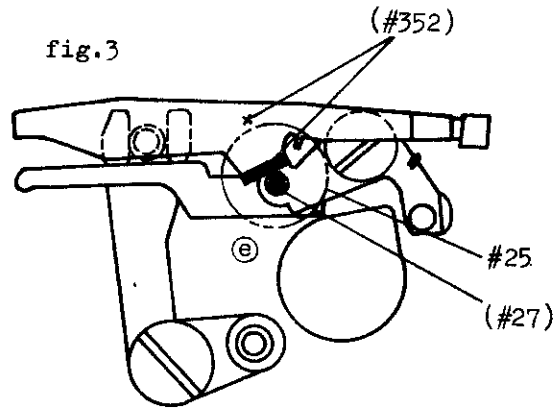
Front view of mirror box

fig.2

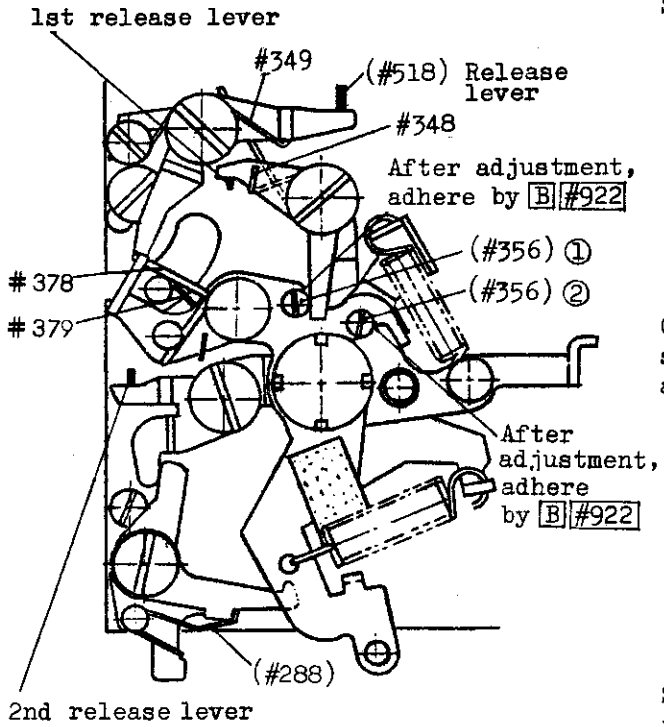


Halfway wind-up position

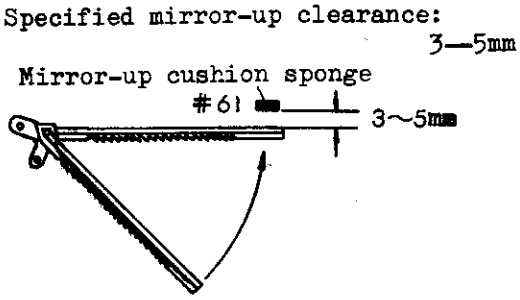
fig.3



㉓ Adjustment of mirror-up clearance and aperture coupling lever height



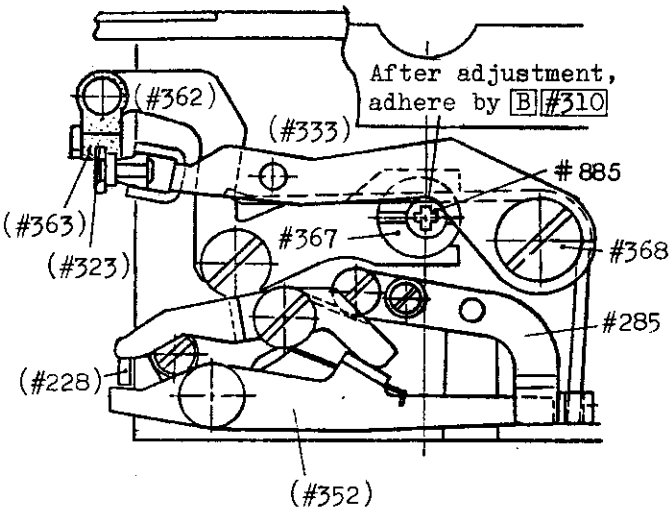
Specified mirror-up clearance:
3—5mm



Clearance between mirror-up cushion sponge #61 and top surface of mirror at the moment shutter is released.

A Make adjustment by eccenter screw (#356) ① .

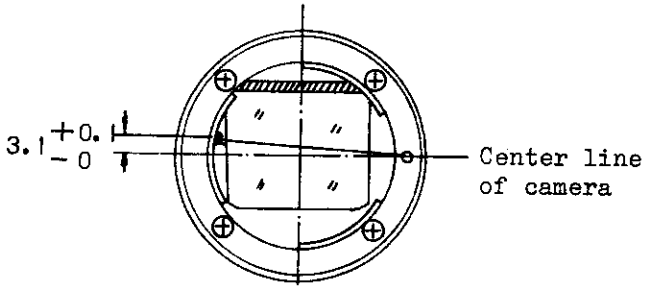
B After adjustment, adhere the screw.



Specified height of aperture coupling lever from camera center:

- After wind-up, $3.1^{+0.1}_{-0}$ mm
- Before wind-up, 3.5mm or less
- Difference between before and after wind-up, 0.15mm or more

T For measurement, use exclusive gauge.



A For adjusting a larger difference before-and-after wind-up than 0.15mm, decenter #367.

A B Adjustment is posible through tripod socket hole. After adjustment, adhere #367 in position.

A After wind-up, make adjustment of $3.1^{+0.1}_{-0}$ mm by eccenter screw (#356) ② .

C After wind-up, make adjustment, make sure of heights before-and-after wind-up by means of coupling lever height tool, and check for correct operation of mirror with normal lens.

㉔ Reassembly of T-dial pulley F7

1/1000sec. position

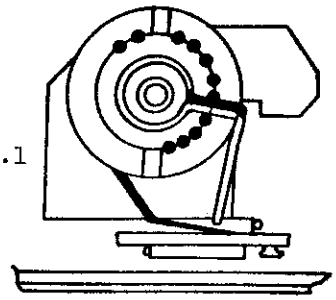


fig.1

Front plate (#6)

↓

T-film base plate B23, T-film B24, T-film washer #624

[R] Clean T-film, using liquid (alcohol/ether) cleaner, and make sure of no scratch, dust, etc. Set click pulley to 1/1000 sec. (Refer to fig.1)

[A] Choose an appropriate thickness of washer #624 (t=0.1—0.4mm).

$$\begin{pmatrix}\text{Standard}\\ \text{thickness}\end{pmatrix} = \begin{pmatrix}\text{Clearance for}\\ \infty\ \text{adjustment}\end{pmatrix} - (0.2\text{mm})$$

T-film is not to be seized by field frame.

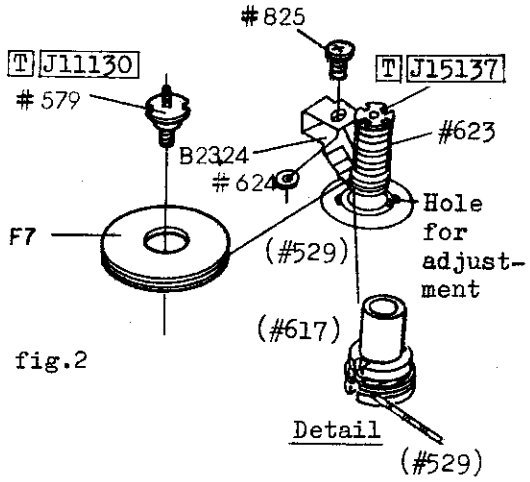


fig.2

#825

↓

T-dial pulley F7, shoulder screw #579

[R] Wind string one turn counter-clockwise round T-film pulley F7, and attach this with #579.

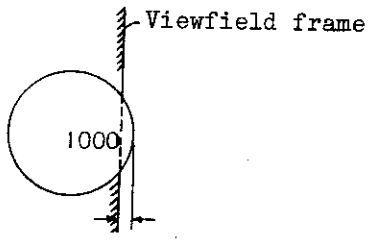
[A] Turn T-film spring 1-3/4 rotations clockwise, and hook it.

[T] Use spring hooking tool J15137.

[N] T-film string #599 should be stretched through notched part of string spool (#617). (Refer to fig.2)

[A] For adjustment of protrusion for shutter speed figure, release screw #825, and shift the position of T-film base plate B23.

[C] Turning T-film pulley, make sure of correct movement of T-film without causing decentring, seizure, scratch, cutting-off,etc.

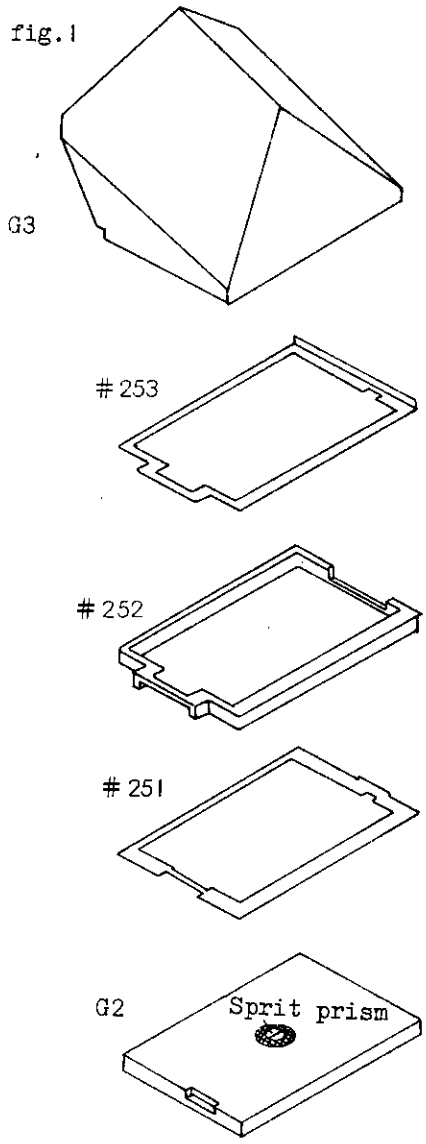


Specified protrusion:
About 0.55mm

(Last 0 of 1000 should touch frame edge line)

㉕ Reassembly of focusing screen and penta-prism

fig.1

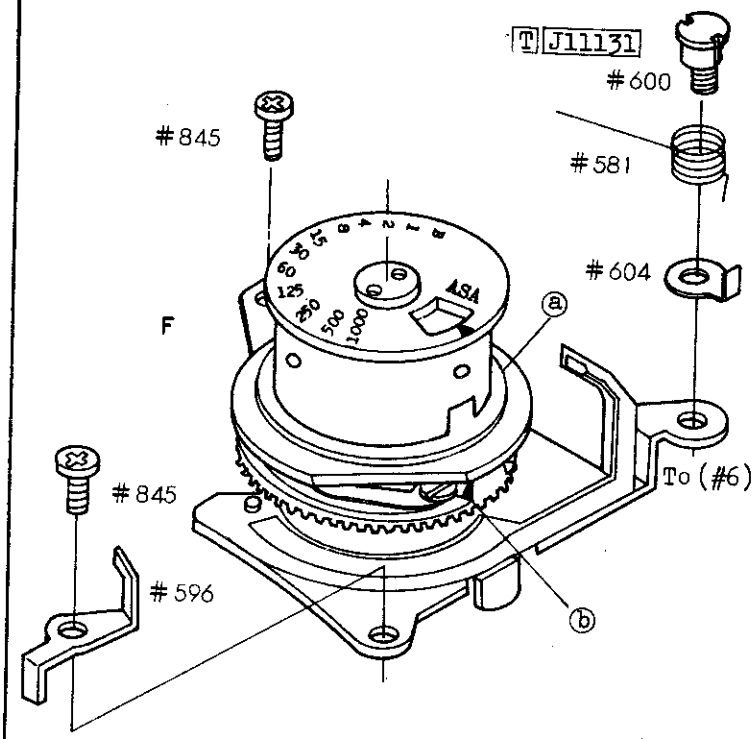


Focusing screen G2
↓
Viewfield mask #251
↓
Spacer #252
↓
Prism mask #253
↓
Penta-prism G3

[N] Take care of setting in correct direction.

↓
Prism retainer sheet #232, penta-prism retainer N2
↓
Prism retaining spring #233×2

㉖ Attaching of functional control unit



Front plate (#6)

↓

Functional control F, ⊕#845×1

R Perform assembly, setting shutter dial indications to actual shutter speeds.

N Make certain of the angular compensation 2.5°.

↓

Lug #604, spring #581, control unit base screw #600

R Attach spring #581 so that it touches part ⓐ.

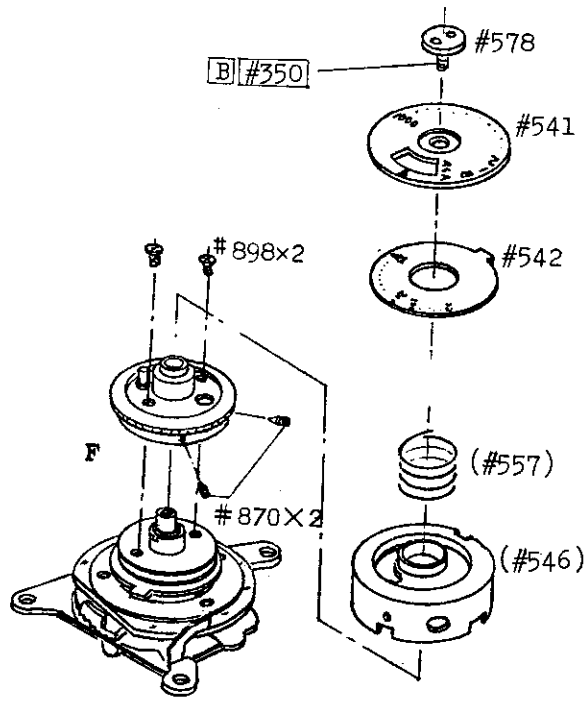
↓

FRE stopper #596, ⊕#845

R Attach FRE stopper #596 in the position where the end surface of the stopper comes against the limit step ⓑ of F-gear.

A For positioning FRE, refer to paragraph ㉘ .

㉗ Attaching of ASA dial and T-dial



Clatch F, ⊖#870×2

↓

T-dial mount ring (#546)

↓

T-dial spring (#557)

↓

ASA dial #542

↓

T-dial #541

↓

Dial top screw #578

(28) Positional adjustment of FRE by FRE stopper

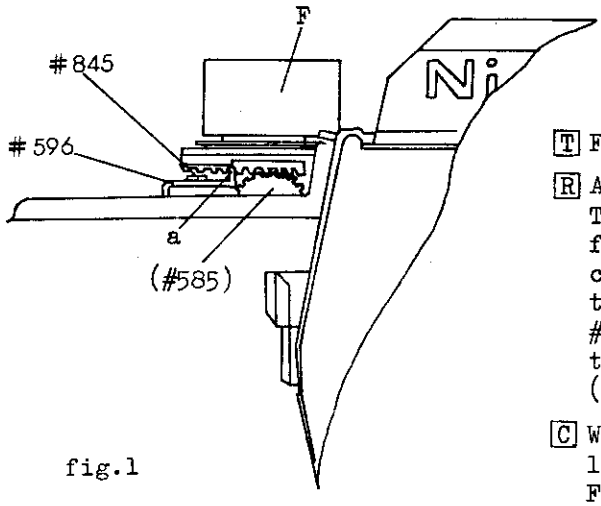


fig.1

T F-figure check gauge (AI) J18065

R Attach the gauge to the camera bayonet. Turn the aperture ring from f/1.4 to f/2, and set it to the first 1/3-step click position. At this time, adjust the attaching position of FRE stopper #596, and bend it at the position a, to ensure no movement of FRE gear F. (Refer to fig.1)

C When aperture ring starts turning from 1/3-step click position to f/2 side, FRE gear F should immediately move. (Refer to fig.2)
Even though aperture ring is turned to f/16 and returened to f/1.4, idle gear-C(#585) should not disengage from FRE gear F.

fig.2

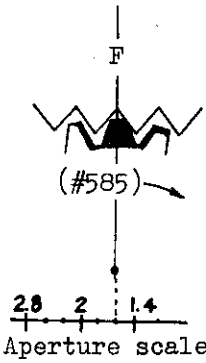
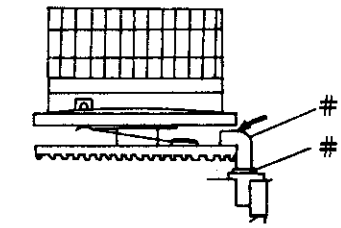


fig.2

A If the disengagement takes place, bend the top of FRE stopper #596 as indicated by the arrow in fig.3.

N While coupling piece #209 is being turned 2.5°(corresponding to 1/3-step) on aperture ring) from specified angular position 52.5°, only front pinion #590 which engaging to aperture coupling ring, should rotate, and gear #588 should not rotate (for realizing full-aperture compensation).

fig.3



Part No. 部品番号	Name 名称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備考
109	Latch cutoff capacitor-A ラッチ防止コンデンサーA	1	7		
110	Latch cutoff capacitor-B ラッチ防止コンデンサーB	1	7		
111	Oscillation cut-off capacitor 発振止めコンデンサー	1	7		
112	Filter capacitor フィルター用コンデンサー	1	7		
113	Offset resistor オフセット用抵抗	2	7		
114	Offset adjust resistor オフセット調整抵抗	1	7		
117	Light emitting diode L E D	1	7,11		
118	Latch cutoff resistor B ラッチ防止抵抗B	1	7		
119	IC grounder pin IC アースピン	1	7		
120	IC pin insulator tube ICピン絶縁チューブ	2	7		-2
120A	IC pin insulator tube ICピン絶縁チューブ	2	9		-2
151	Lead wire, lever SW 0.65×200 (赤) (red) レバースイッチリード線	1	3		
152	" , FRE 0.65×70mm (桃) (pink) FREリード線	1	7		
154	" , FRE 0.65×90 (黒) (black) FREリード線B	1	7		
155	" , PD 0.66×28 (red) 測光用PDテフロン線A(赤)	1	7		-2
155A	" , PD 0.66×28 (白) (white) 測光用PDテフロン線B	1	9		-2
156A	" , PD 0.66×32 (赤) (red) 測光用PDテフロン線C	1	9		-2
156	" , PD 0.66×32 (白) (white) 測光用PDテフロン線D	1	9		-2

(29) Adjustment of T-dial and ASA dial

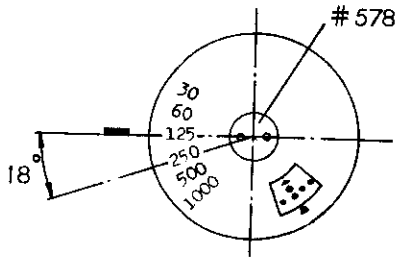


fig.1

[A] Once releasing dial top screw #578, bring any figure on ASA scale to the index , and also shutter speed scale to index line on camera top cover. Fasen up the screw. (Angle for one step on T-dial is 18°, and that for 1/3 step on ASA dial is 6°.)

Correcting the resistance of FRE

[T] Digital VOM J9003-2, F-figure check gauge (AI) J18065

[C] Connect the test leads to FRE printed lead (#572) and lug where connected with lead #154, make measurement resistance of FRE for each EV. (fig.3)

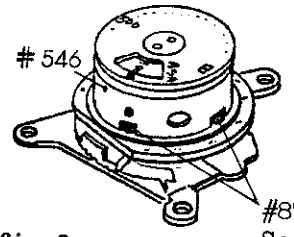


fig.2

Resistance at ASA 100 should be as below for each EV:

EV	Shutter speed / f-number	Max. (kΩ)	Standard (kΩ)	Min. (kΩ)
1	B / f/2	0.51	0.45	0.38
9	1/15 / f/5.6	8.80	7.65	6.50
15	1/500 / f/8	15.01	13.05	11.09

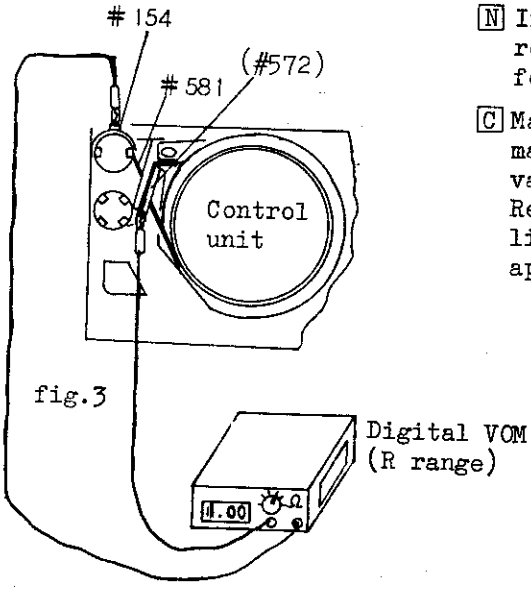


fig.3

[N] If it differs from above specified value, release set screws #870×2, and rotate FRE, for adjustment. (fig.2)

[C] Manipulating aperture ring and shutter dial, make sure of continuous change of resistance value (without jump and standstill). Resistance should not differ from specified limit, depending upon rotating direction of aperture ring.

(30) Attaching of IC printed circuit

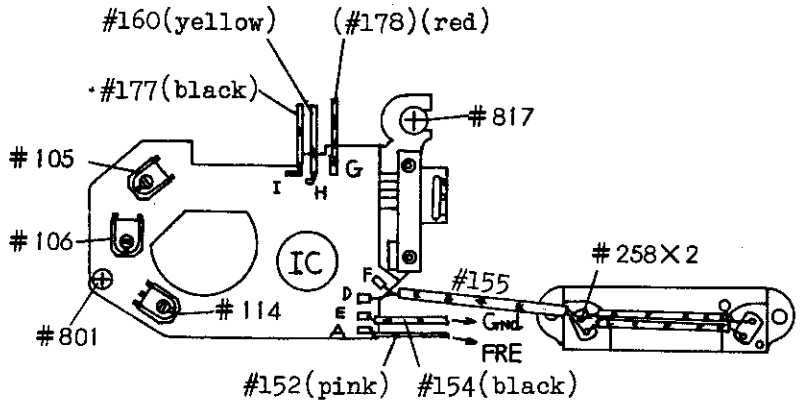


fig.1

IC printed circuit, ⊕#801×1, ⊕#817×1

↓

N When inserting exposure mark film #242 into opening of viewfield frame, be careful not to make scratch. For positional adjustment of the film, refer to fig.3.

Eyepiece mold N4, ⊕#839×2

↓

N Each photo-diode #258 is to be arranged so that the dot on its cathode side is pointed respectively, as shown in fig.2.

B #350

↓

Soldering of leads #160(yellow), #178(red), #154(black), #177(black), #152(pink)

N For soldering position of each lead, refer to fig.1.

N After soldering, remove remnant of flux, using a liquid cleaner (alcohol/ether), and apply moisture proofing coat (silicone) to each soldering part.

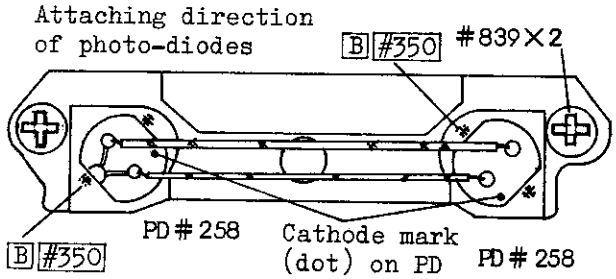


fig.2 (Back cover side)

Cautions to be taken in handling and soldering IC printed circuit:

As compared with conventional exposure meters, the present one measures extremely minute corrent. Thus, since the circuit requires an extremely high input impedance, the IC is unavoidably liable to be injured.

1) Soldering iron should ensure electrical insulation, and provided with a grounder lead.
2) IC printed circuit is not to be touched with bare hands. Put on gloves, when handling.
3) Do not make solder bridge.

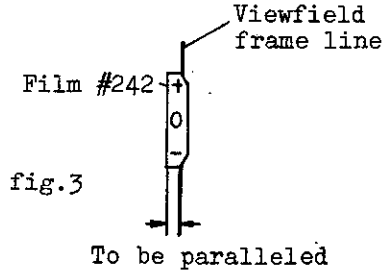


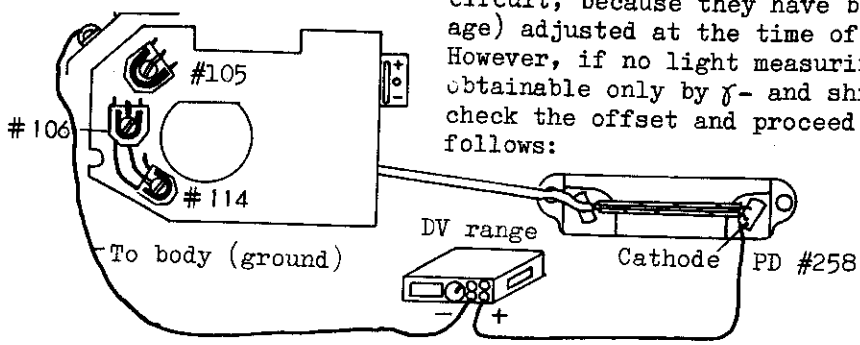
fig.3

Positioning of exposure mark film #242

A For adjusting protrusion of the film #242 into viewfield, release screws ⊕#801 & ⊕#817, and move the whole IC printed circuit (M).

N Side edge of the film should be parallel to viewfield frame, and markings + O − not be cut-off by the frame.

(31) Adjustment of light measuring accuracy



As a rule, do not attempt to adjust IC printed circuit, because they have been offset (voltage) adjusted at the time of assembling. However, if no light measuring accuracy is obtainable only by γ- and shift-adjustment, check the offset and proceed to adjustment as follows:

Basic method

1) Offset voltage adjustment at EV 15

Specified allowance: within ±0.5mV
(Try to approach zero as far as possible)

Measuring method

[T] Digital VOM with input impedance 1000MΩ or more and resolving power 10μV or higher
Connect the meter as shown in fig. above.

[T] Light measuring box J1804-1 with 50mm/1.4 lens, tool cover J15138 and screwdriver J5129

[A] ① Set ASA to 100, shutter speed to 1/500, and aperture to f/8.

② Using light measuring box, make adjustment at EV15 by means of VR #114, so that the voltage becomes to within ±0.5mV.

[N] Part connected to meter's ⊕lead being coated with a moisture proofings (silicone), remove this using a liquid cleaner (alcohol/ether).
After connection, let finger off from meter leads to ensure correct measurement.

2) γ-adjustment (At EV 15)

Measuring method

Using 50mm/1.4 lens, set ASA to 100, shutter speed to 1/500sec. and aperture to f/8.

\+ ○
○ ● Control VR #105 so that only this LED lights.
− ○

[N] ● represents lighting of LED

3) Shift-adjustment (At EV 4)

Measuring method

Using 50mm/1.4 lens, set ASA to 100, shutter speed to 1/2sec. and aperture to f/2.8.

\+ ○
○ ● Control VR #106 so that only this LED lights.
− ○

4) Checking all accuracies at EV 4, 6, 9, 11 and 15

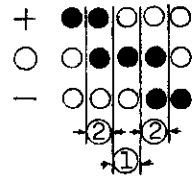
Measuring method

Using 50mm/1.4 lens, set ASA to 100, setting shutter speed and aperture to all combination values.

Zone-①, correct exposure point ±0.5EV

Dead zone, 0.3—0.6EV

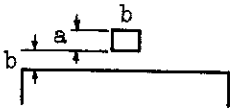
Zone-②, Two-LEDs lighting range = 0.7—1.1EV



[N] Make sure that 5 step indications are accomplished positively. Though the dial or ring is turned within their click slacks or other slacks, no other LED lights.

(32) Positioning of F-figure window in the viewfield

Specified position of F-figure window (0.5~1)b



No remarkable tilting of window relative to viewfield frame is permitted.

•Position of window relative to viewfield frame

Tilted 5.6

[A] Shift F-mask plate #237, or tilt F-mirror holder N1.

Too low 5.6

Too high 5.6

[A] Tighten or loosen F-mirror adjusting screws ⊕#875×2

•Position of F-figure relative to window

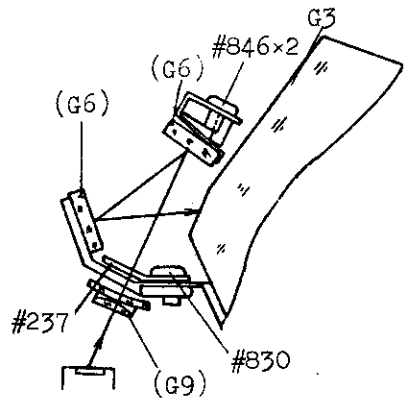
Right-sided 5.6

Left-sided 5.6

Too low 5.6

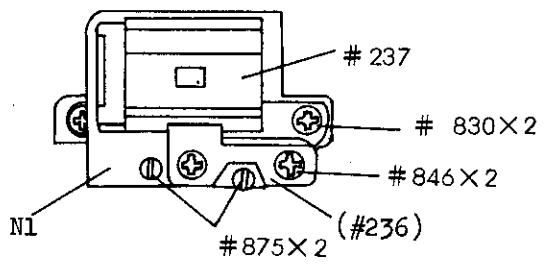
[A] Shift F-mask plate #237

Image of frame line on gauge

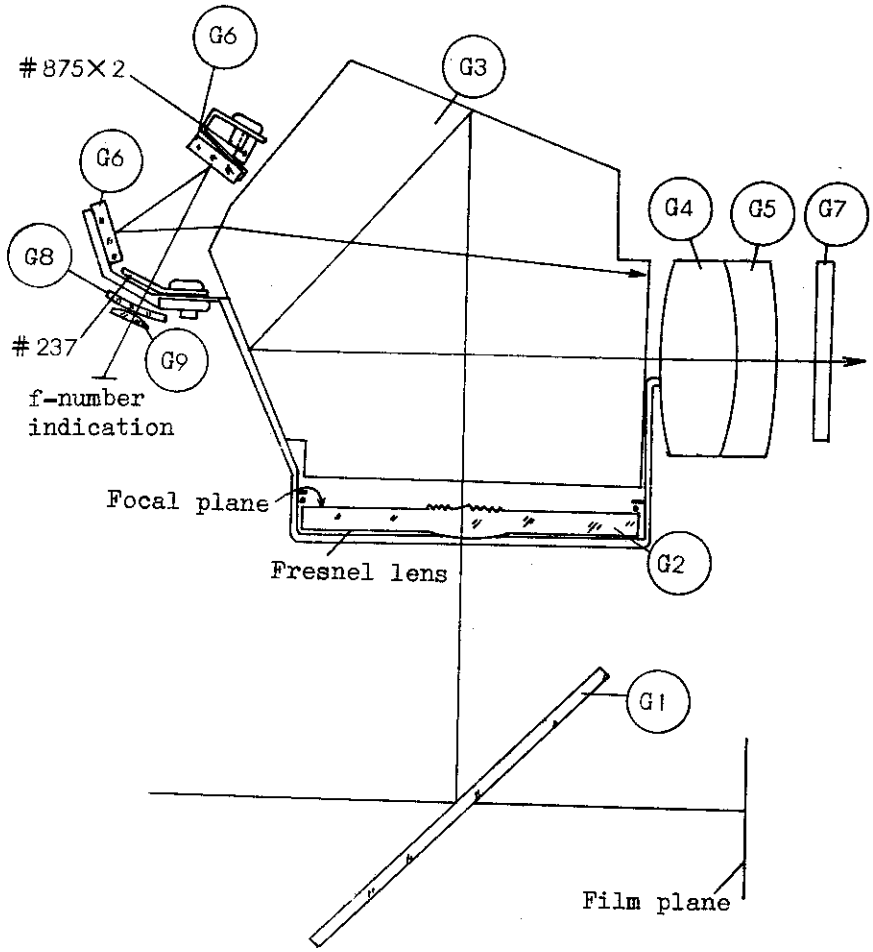


[T] Ordinary AI lens, F-figure check gauge J18065, AI F-figure window check gauge J18063

[C] When checking for correct positin of the window, attach gauge J18063 onto camera bayonet. See that image of window frame line on the gauge appears in the F-figure window.



(33) Optical system of finder

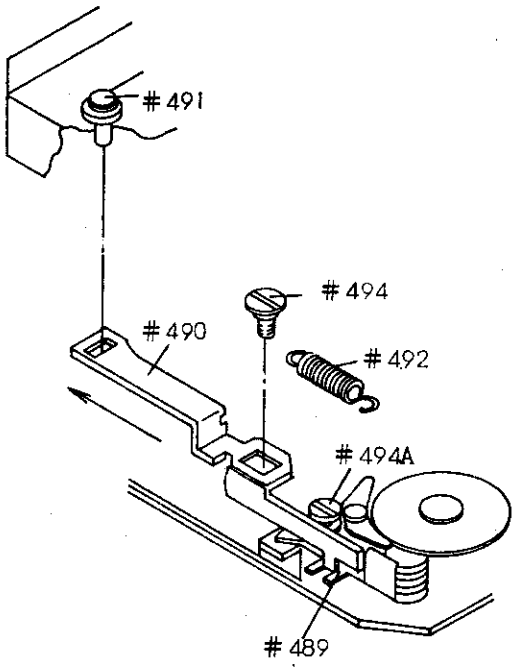


To reduce total height of camera body, focusing screen is provided with focal plane on top and Fresnel surface on bottom.
This Fresnel surface is used simultanously as condenser lens.

Specified diopter of finder: -1 ± 0.5 diopt

(Equipped with K-type focusing screen)

(34) Attaching of multi-exposure arm A



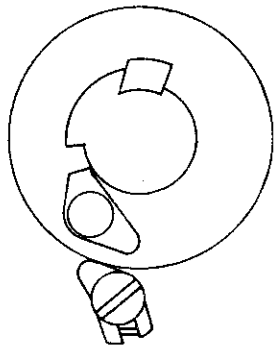
Multi-exposure arm A #490, return spring #492

[R] Insert end of multi-exposure arm A #490 into fork of #489. Hook up one end of spring #492 on screw stud #494A and the other end in notch of arm A.

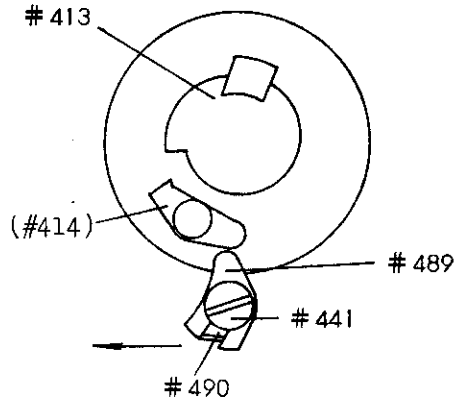
Guide pin #494

[C] After attaching, push arm A #490 following the arrow, and wind up. At this time, make sure that spool and sprocket do not rotate but shutter charge is positively realized.

Normal position



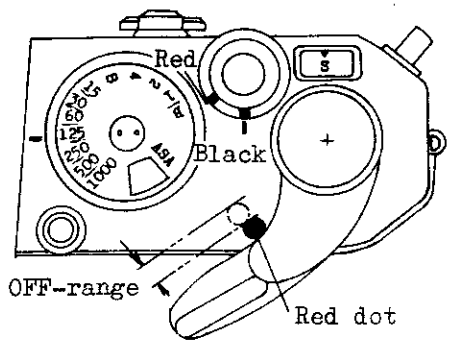
Muti-exposure position



In the position for multi-exposure, make sure that charge cam release claw lever #489 pushes claw (#414), and the claw disengages completely from charge cam #413.

(35) Adjustment of ON/OFF positions of lever switch

fig. 1



Specified ON/OFF positions (See fig.1)

ON-range: Beyond red dot diameter

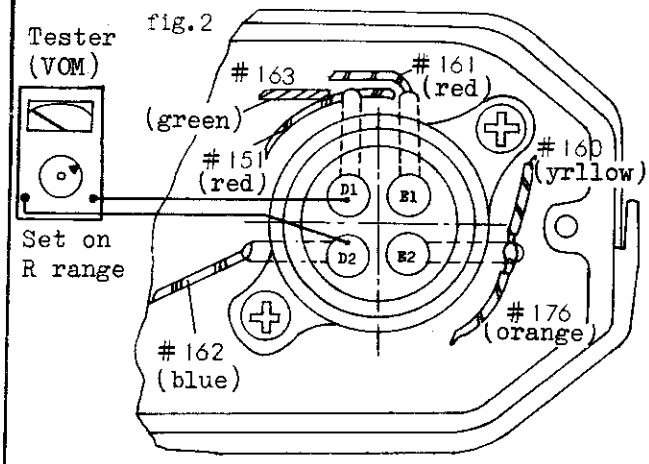
OFF-range: Within diameter assumed the same as that of red dot

[A] Bend lever switch contact A #487 or B #488, so that the switch turns ON and OFF within above specified ranges, respectively.

[N] For checking ON/OFF positions, see that LED lights up/goes off. Lever switch should not be turned OFF, when wind-up lever is in halfway-, complete-wind-up or spring-back position.

Checking for ON/OFF of MD switch

fig. 2



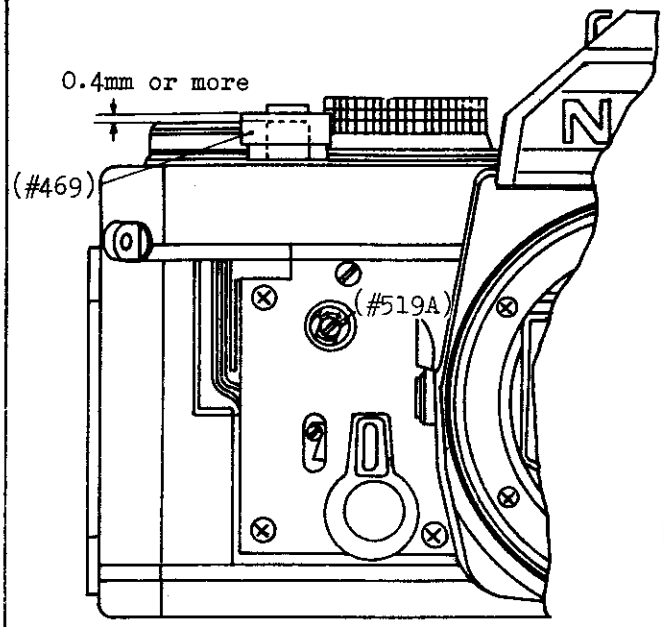
[T] Connect leads of tester (set on R range) to D1 and D2.(fig.2)

[C] In the positions as shown in the following table, check that MD switch is turned ON and OFF positively.

Relative ON/OFF of lever switch and MD wind-up switch, in each operation step

Lever switch	Shutter button ring (Change-over SW)	Wind-up lever	Wind-up position	MD SW	Conduction of D1 across D2
ON	Locked	Pull out	Halfway	ON	No conduction
OFF	Locked	Flush	Halfwsy	ON	Conducted
OFF	Released	Flush	Halfway	ON	No conduction
OFF	Locked	Flush	Complete	OFF	No conduction
OFF	Released	Flush	After shutter released	ON	No conduction
OFF	Locked	Flush	"	ON	Conducted
ON	Locked	Pull out	"	ON	No conduction

(36) Adjusting of releasing position of release button



[T] Micrometer for release button J18002

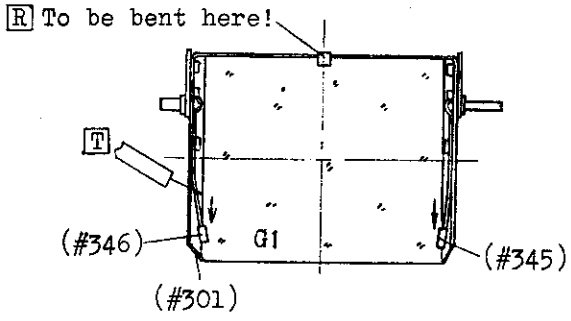
Specified stroke of release button: 2.5 0.3mm

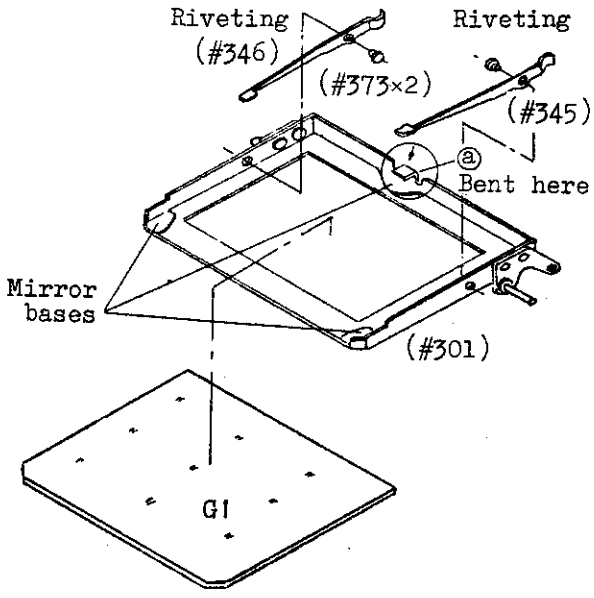
[N] Sutter should be released when the top surface of the button lowered 0.4mm or more from top surface of release button ring (#469).

[A] If not, make adjustment by means of eccenter pin (#519A).

[C] After adjustment, make sure of positive opration of BULB (B).

(37) Replacement of mirror





[D] For replacement of mirror, insert a stick with pointed end between mirror side and mirror retainer A (#345) or B (#346) as shown in lefthand fig., and move it in the direction of arrow to draw out the mirror.

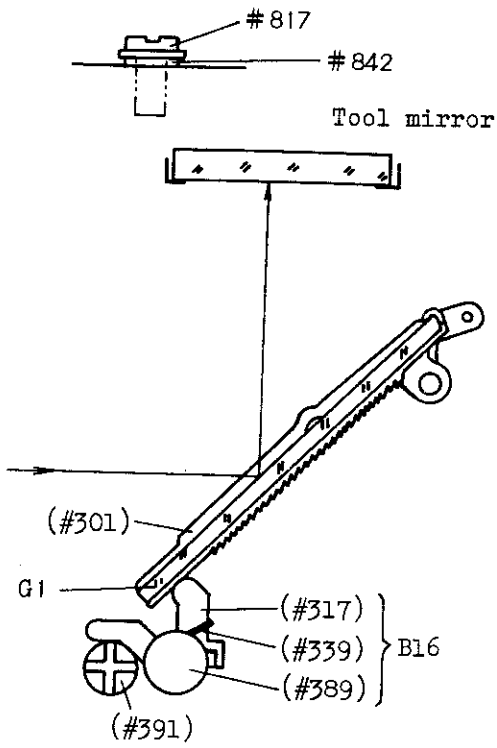
[N] Be careful not to scratch mirror surface and deform mirror retainers A and B.

[R] After inserting mirror into its holder (#301), bend the portion ⓐ of the holder in the direction of arrow as shown in fig.

[N] Take caution not to break mirror.

[C] After replacement, make sure of no one-sided dim focus in four corners of viewfield.

(38) Adjusting 45 of mirror and infinity (∞) coincidence



1) Adjusting of 45°

[T] Optical parallel, tool mirror and vertical-type collimator f=500mm

[A] Place optical parallel onto camera bayonet basis. Inserting tool mirror into prism box #250, take reading of displacement of reflected image in X- and Y-directions on reticle of the collimator.

X-direction adjustment

(Allowance: Within 5')

Adjust vertical movement of 45° stopper B16 by means of 45° adjusting pin (#391).

Y-direction adjustment

(Allowance: Within 10')

According to displacement, change adjusting washer #842a—u (t=0.05—1.2mm) under prism box. (#842a—u for 32FB are utilized.)

Allowance of deformation (indistinctness): Within 5'

[N] No difference of above displacements or deformation before-and-after wind-up and by releasing the shutter several times are permitted.

2) Infinitiy (∞) coincidence adjustment

[T] Reference lens 50mm/1.4, horizontal-type collimator f=500mm

Specified coincidence: ±30'

[A] Make adjustment by changing adjusting washers #842a—u at 4 points uniformly under prism box.
For fine adjustment, use eccenter pin (#391).

3) Picture field adjustment

[T] Reference lens, picture field chart and its stand, focusing glass

Allowable parallax (in vertical and lateral directions on the aperure plane: Within 0.5mm

Inclination of viewfield in relation to chart image: Within 1°30'

7. TROUBLE SHOOTING

(1) Causes of mechanical faults

Item	Fault	Conceivable cause	Action to be taken
Winding-up	Incorrect returning of wind-up lever	Getting out of place or break of lever returning spring #406	Reattaching or replacement of spring
	Heavy winding-up or squeaking	∘Spool washer (#455A) short of oil	Apply grease G7100
		∘Attaching screws #807 for lower bracket (#452) loosened	Fasten #452 in position with #807 at a smoothly rotating position of spool shaft A9
		∘No thrust slack provided for spool shaft A9	Selecting of washer #897A--C
	Winding-up impossible	∘Entrance of extraneous substance	
		∘Shutter does not operate	Replace the shutter
		∘Pendulum #462 and/or ratchet cam A10 seized	Positional adjustment of pendulum
		∘Sprocket stopper cam setscrew loosened	After positioning, refasten the setscrew
		∘Incorrect return of release shaft #527 together with MD release shaft	
		∘Movement of self-timer seized	Remove scraps, etc. if any, from self-gear, or replace shutter
		∘Incorrect mirror charge	Adjustment of charge
	Invalid wind-up	Blank shot check lever #26 does not operate	Strengthen pushing of MD wind-up switch contact B #907, or apply grease G7100 Strengthen MD signal lever spring #30 Provide MD signal lever shaft with slack
	Occasional invalid winding-up	Getting out of place of charge cam claw spring #412	Reattaching of the spring
	Multi-exposure does not operate	∘Getting out of place of return spring #492	Correct attaching of the spring
		∘Getting out of place of top end of arm A #490 from fork of lever #489	Bending of top end of #490
		∘Getting out of place of knob #491 from hole on arm A #490	Bending of the hole end of #490
	Incorrect position of sprocket	∘Displacement of sprocket collar A nut #437	Readjustment (Refer to Inspection Standards)
		∘Loosen of screw #824	

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
160	" , power source 0.65×110 (黄) (yellow) 測光用電源リード線	1	7		
161	" , power source 0.65×40 (赤) (red) MD測光用電源リード線B	1	13		
162	" , MD switch 0.65×190 (青) (blue) MDスイッチリード線	1	2		
163	" , rear curtain signal 0.65×45 (緑) (green) 後幕シグナルリード線A	1	13		
164	" , " 0.65×195 (紫) (violet) 後幕シグナルリード線B	1	2,13		
175	" , sync 0.65×100 (緑) (green) シンクロリード線B	1	4		
176	" , lever switch (Or) 0.65×200 (オレンジ) レバースイッチリード線A	1	3		
177	" , grounder 0.65×85 (黒) (black) 電源マイナスリード線	1	7		
178	" , power source 0.65×80 (赤) (red) 測光用電源リード線	1	7		
201	Lens mount base マウント台	1	8		
202	Bayonet ring バヨネットリング	1	8	32FB1-#202	
208	Bayonet spring バヨネットバネ	3	8	32FB-#208	
210	Coupling lever spring 絞り連動片バネ	1	8		
216	Lens release button spring 着脱ボタンバネ	1	11	32FB-#216	
218	Lens release button sleeve 着脱ボタン軸受	1	11	32FB-#218	
221	Spring 引張バネ	1	8		
222	Coupling ring stopper 連動環回転制限	1	8		
223	Coupling lever button 連動片ばねボタン	1	8		

Item	Fault	Conceivable cause	Action to be taken
Winding-up (continued)	Too large slack of sprocket at wind-up limit	∘ Displacement of sprocket stopper cam #429	Readjustment
		∘ Incorrect movement of sprocket stopper A12	Readjustment
		∘ Cutting off of stopper spring #496	Replacement
	Reversal prevention not effective	∘ Too weak claw spring (#445)	Adjustment of spring pressure
		∘ Seized movement of claws A (#443) and B (#444)	Adjustment or replacement
	Picture frame not advanced	∘ Too early releasing of pendulum #462	Adjustment
		∘ Incorrect position of sprocket	Adjustment
		∘ Too weak friction of spool	Adjustment (Refer to Inspection Standards)
	Incorrect charge of shutter	∘ Tilting of charge lever pin #22	Replacement
		∘ Inappropriate bending of shutter charge claw #37	Correct bending or replacement
		∘ Too early relreasing of pendulum #462	Adjustment
	Incorrect mirror charge	∘ Inappropriate bending of top end of mirror charge lever B11	Correct bending or replacement
		∘ Incorrect movement of mirror down latch lever #330	Apply grease G7100
		∘ Too early releasing of pendulum #462	Adjustment
Picture frame counter	Incorrect advance	∘ Incorrect position of counter eccenter axle #516	Readjustment of position of the axle
		∘ Getting out of place of spring #521	Correct attaching
		∘ Too large slack or incorrect movement of advance claw (#510)	Adjust slack by means of axle #512
		∘ Incorrect shapes of teeth of ratchet #532	Replacement
	Incorrect return	∘ Getting out of place of spring #521	Correct attaching
		∘ Incorrect movement of ratchet claw #506	Adjustment by means of claw nut
Shutter release	Shutter release button cannot be pushed	Incorrect movement of lock lever #464	Apply oil, or provide a slack by means of lock lever axle #539. Strengthen lock lever spring #465
	Too early or late releasing of shutter	Incorrect adjustment of release lever axle #519A	Readjustment (Refer to "Inspection Standards")

7. TROUBLE SHOOTING

(1) Causes of mechanical faults

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⊖LED remains lighted	118 — 119
⊕LED remains lighted	118 — 119
Lighting of LEDs ⊕ and ⊖	118 — 119
Even though exposure factors are fully altered, LEDs respond only to such an extent as ⊖→⊖◎ or ⊕→⊕◎	120 — 121
All of three LEDs remain lighted	120 — 121
Only one or two of three LEDs emit light	120 — 121
LEDs do not respond to the brightness in the normal sequence	120 — 121

Note: The parts enclosed with (#) are not available individually.

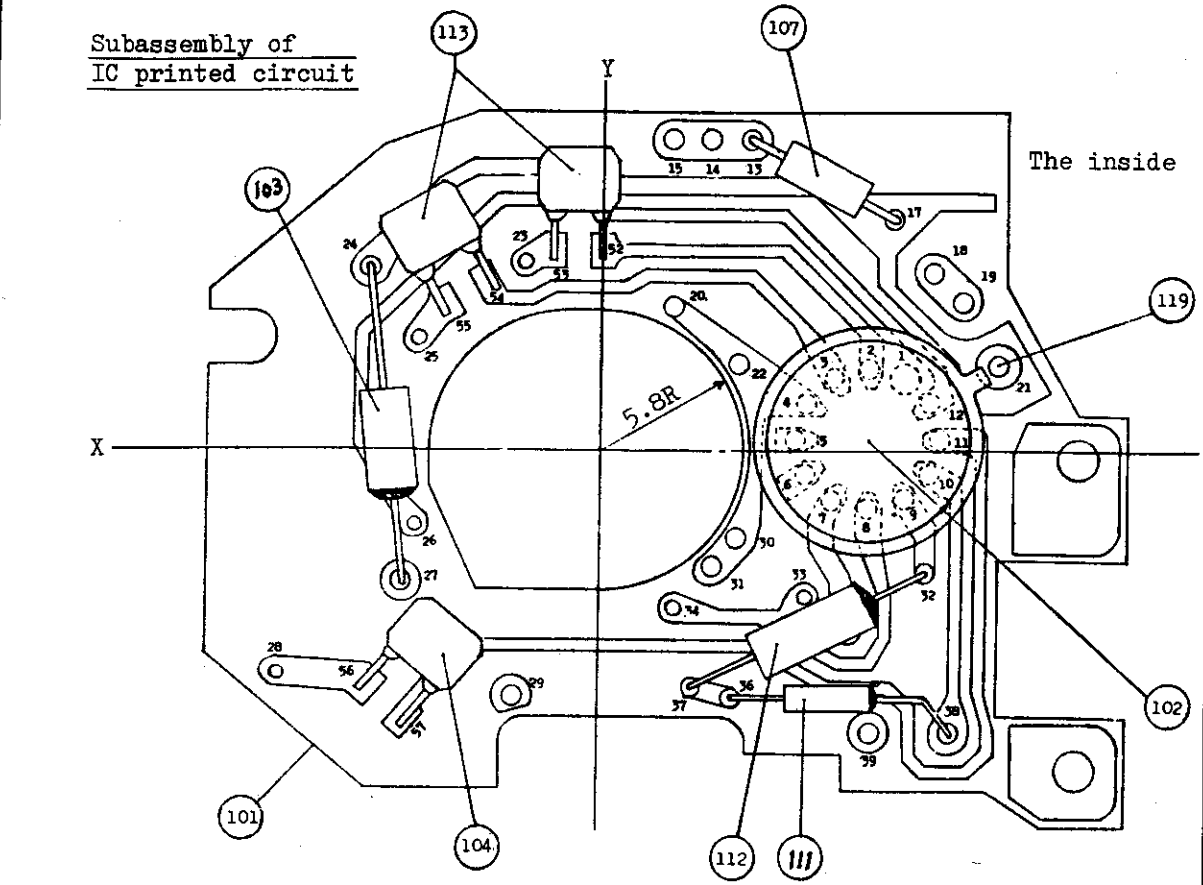
Item	Fault	Conceivable cause	Action to be taken
Shutter release (continued)	Shutter releasing seized	∘Seizure between release lever fork #518A and release lever guide pin #879	Apply grease G7100, or grind off engaging surface with oil-stone
		∘Seizure between release lever pin #519A and release lever fork #518A	Apply grease G7100, or grind off engaging surface with oil-stone
		∘Seized engagement of mirror-up lever (#322) to mirror-up stop lever #329	Apply grease G7100, or grind off engaging surface with oil-stone
Mirror box	Too large sound by mirror-up impact	∘Air damper not effective	Replacement of air damper
		∘Getting out of place of cushion rubber #372	Reattaching
		∘Getting out of place of down lever cushion rubber #363	Correct attaching
		∘Too weak or strong rear brake spring #286	Adjustment
		∘Slackness between mirror holder B26 and mirror G1	Bend mirror retainers, or replacement of mirror holder
	Incorrect clearance of mirror-up	Incorrect adjustment of eccenter-pin (#356)	Readjustment
	Mirror-up occurred by attaching lens	Insufficient height of aperture coupling lever B10 Specified : $3.1^{+0.1}_{-0}$mm Difference between before-and-after wind-up : 0.15mm	Adjustment of before-and-after difference by down lever eccenter #367 Adjustment by eccenter pin (#356) Bend aperture coupling lever (#315) to some extent
Self-timer	Setting impossible Shutter is not released Stops on the way	∘Poor shutter	Replacement
		∘Movement of self-timer axle B2	Apply grease G7100
	Not cancelled by returning of self-timer lever to original position	Poor shutter	Replacement
Shutter	No correct time obtained	Poor shutter	Replacement
	Movement of curtain seized	Poor shutter	Replacement
	Rear curtain does not return	Too strong brake spring #286	Adjustment
Synchronization	Incorrect time lag	∘Incorrect clearance of X-contact points	Adjustment of the clearance
		∘Poor shutter (times or X-contact)	Adjustment or replacement

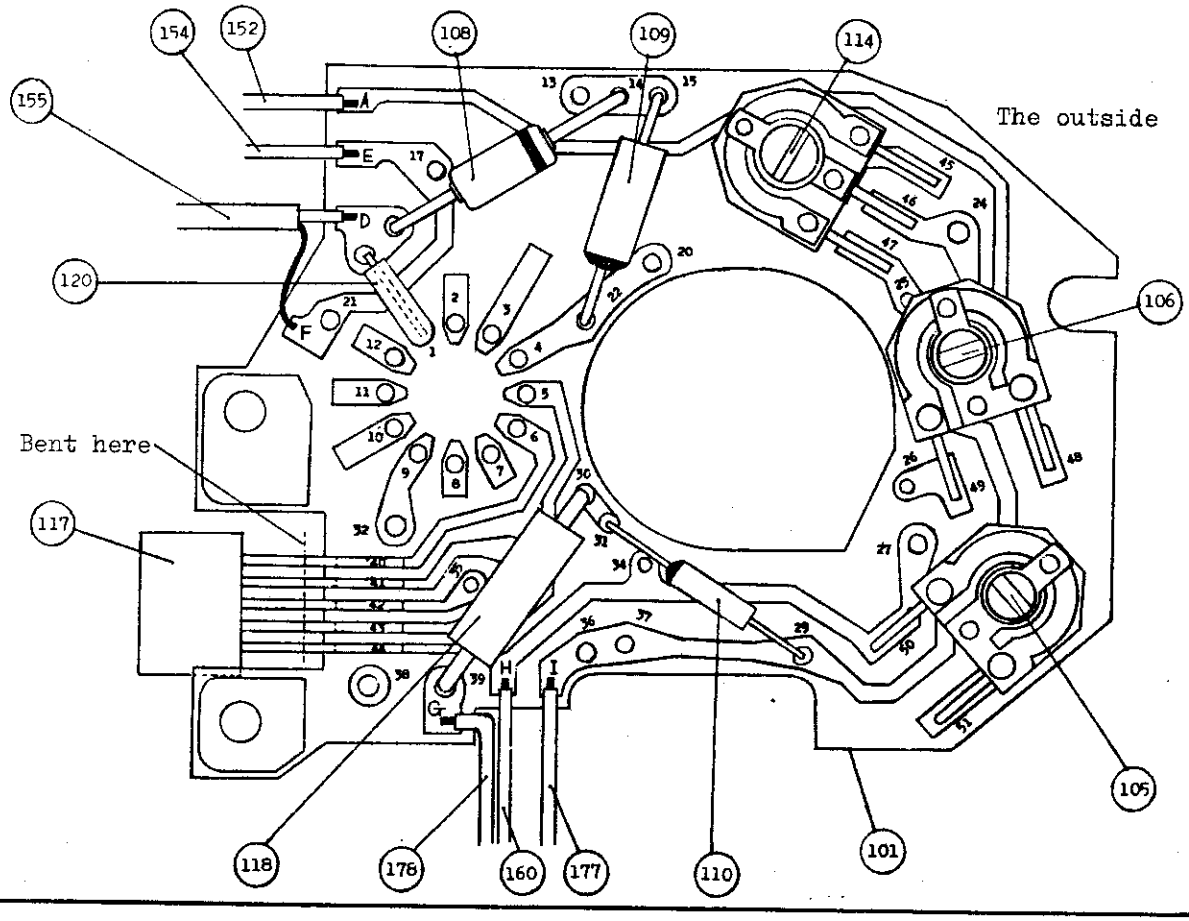
Item	Fault	Conceivable cause	Action to be taken
Synchronization (continued)	Poor insulation	∘Poor sync socket #15	Replacement
		∘Poor shutter	Replacement
		∘Poor insulation of sync contact C	Replacement
		∘Poor insulation of lead wire #175	
		∘Poor soldering of X-contact terminals	
	No conduction	∘Poor shutter	Adjustment or replacement
		∘Disconnection of lead #175	Replacement
		∘Poor sync socket #15	Replacement
		∘Poor contact of #69 with #70	Cleaning or replacement of the contact
		∘Poor conduction between contact #69 and sync contact (#75)	Cleaning or replacement of the contact
Aperture coupling ring	Movement seized, uneven or heavy	∘Incorrect attaching of lens mount B3	Reattaching to smoothly moving position of coupling ring
		∘Incorrect fitting of lens mount B3 to aperture coupling ring B4	Selection of fitting of B3 to B4
		∘Too deep engagement or disengagement of idle gears A, B and B28 with gear #588	Adjustment of engagement
		∘Too deep engagement of idle gear (#585) with FRE gear (F4)	Adjustment of engagement
		∘Shutter top cover #62 rises, touching with brush base plate (#564)	Bending of #62
	Incorrect start position of coupling piece	Displacement of coupling ring stopper #222	Readjustment
Rewind button	Cannot be set	∘Incorrect movement of AR-lever #537	Apply grease. Strengthen AR lever spring #537B. Provide slack to AR lever axle #537A
		∘Heavy movement of sprocket shaft #434	Apply grease, or replacement
	Incorrect return	Incorrect movement of AR-lever #537	
Rewinding	Heavy or uneven	Squeaking between rewind shaft #652 and rewind shaft guide #665	Replacement
Shutter dial	Heavy, uneven or too light turn	∘Poor shutter	Replacement
		∘Incorrect stretching of string	Restretching of string

Item	Fault	Conceivable cause	Action to be taken
Shutter dial (continued)	Heavy, uneven or too light turn	∘Incorrect rotation of click pulley #571	Apply grease G8181 to click groove and click holes
		∘Poor functional control unit	Replacement
		∘Incorrect rotation of T-pulley F7	Replacement
	Displacement of speed indication	Incorrect adjustment of control unit	Readjustment
ASA dial	Displacement of ASA indication	Incorrect adjustment of control unit	Readjustment
Viewfinder	T-film not moved	Cutting off of string #599	Replacement
	Movement of T-film seized	∘T-film (#621) touches finder frame	Change washer #624, refer to 6.-(2)-(24)
		∘Getting out of place of T-film spring #623	Correct attaching
	Decentration of T-film indication	∘Decentration of T-film (#621)	Replacement
		∘Incorrect wreathing of string on T-film string spool (#617)	Adjustment
		∘Attaching of adhesive on T-film string #599	Remove adhesive or replacement
	Displacement or tilt of aperture indication window	∘Poor T-dial pulley F7	Replacement
		Incorrect adjustment	Readjustment
	Displacement of exposure mark	∘Incorrect attaching of exposure mark film #242	Reattaching
		∘Incorrect attaching of IC printed circuit M	Reattaching
	Incorrect infinity (∞) coincidence	∘Incorrect adjustment	Adjustment
		∘Displacement of 45° stopper B16	Replacement
		∘Slackness between mirror holder and mirror G1	Correct retaining, or replacement of mirror holder
		∘Too weak of mirror spring (long) #378	Strengthen or replacement
	Cutting off of viewfield	∘Incorrect 45° of mirror	Readjustment
		∘Incorrect attaching of prism box #250	Readjustment
MD switch	Poor conduction of MD socket	∘Poor contact of MD socket pin	Adjustment
		∘Poor contact of MD wind-up switch A5	Cleaning or adjustment of contact pressure
		∘Poor contact of MD switch K	"
		∘Disconnection of leads #162, #163 or #164	
		∘Heavy movement of MD switch stopper P4	Adjustment of spring #476

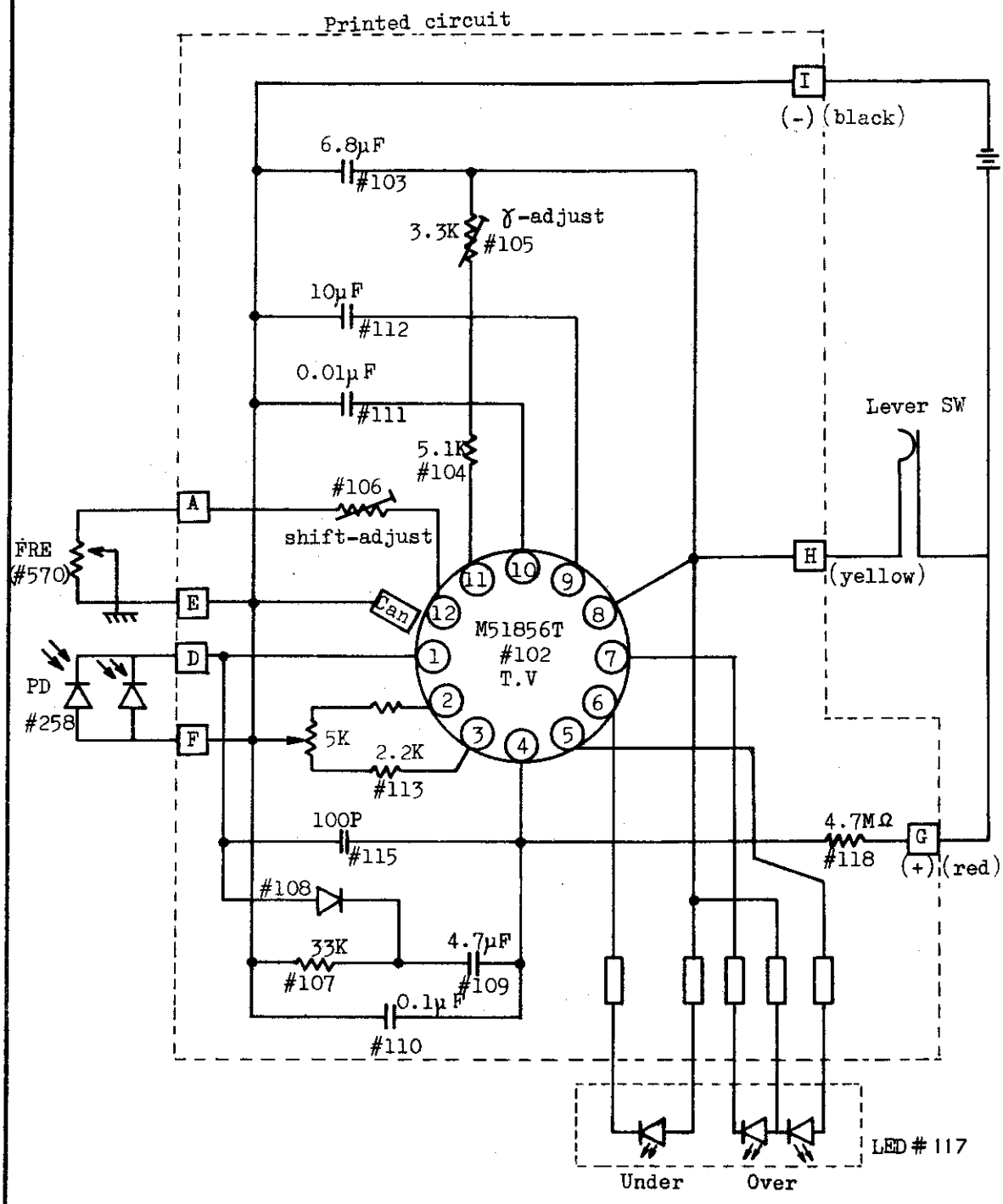
(2) Causes of electrical faults

Subassembly of
IC printed circuit

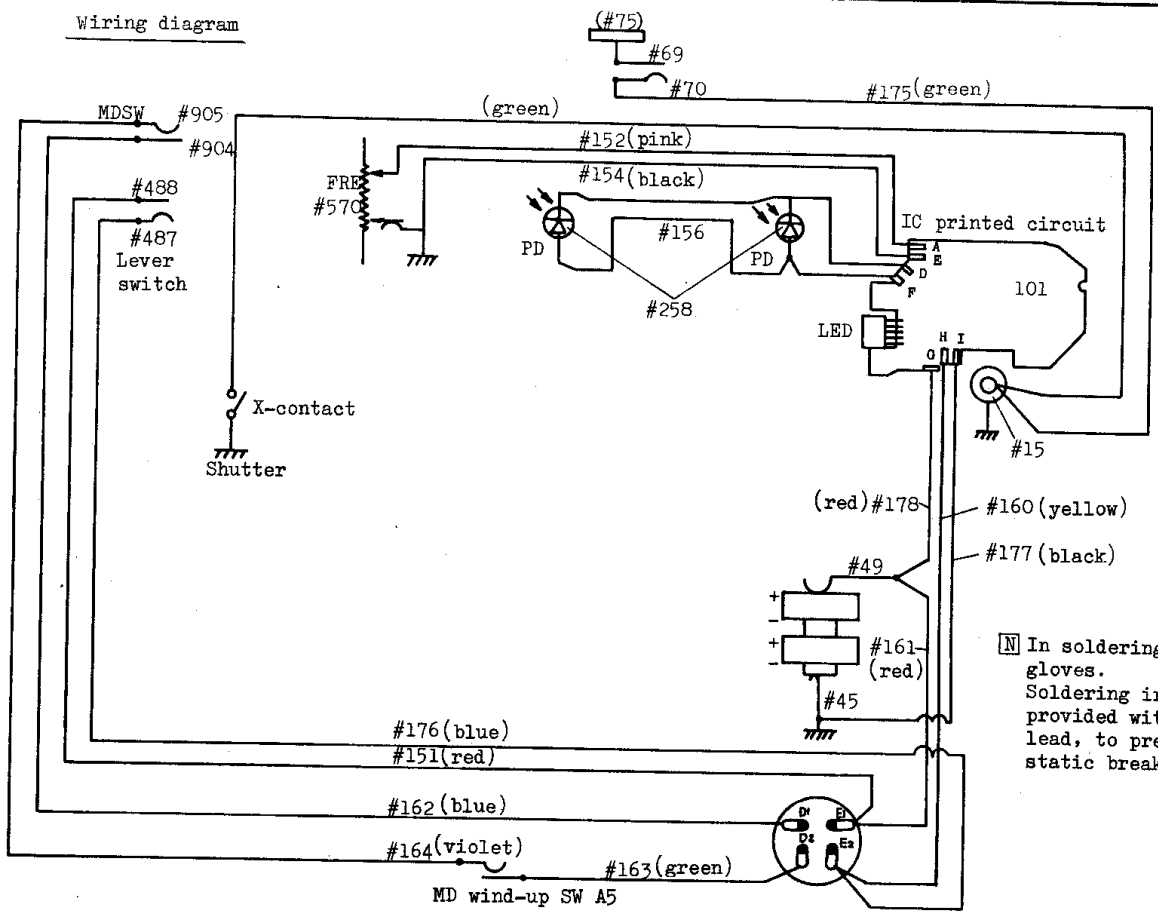




Light measuring circuit



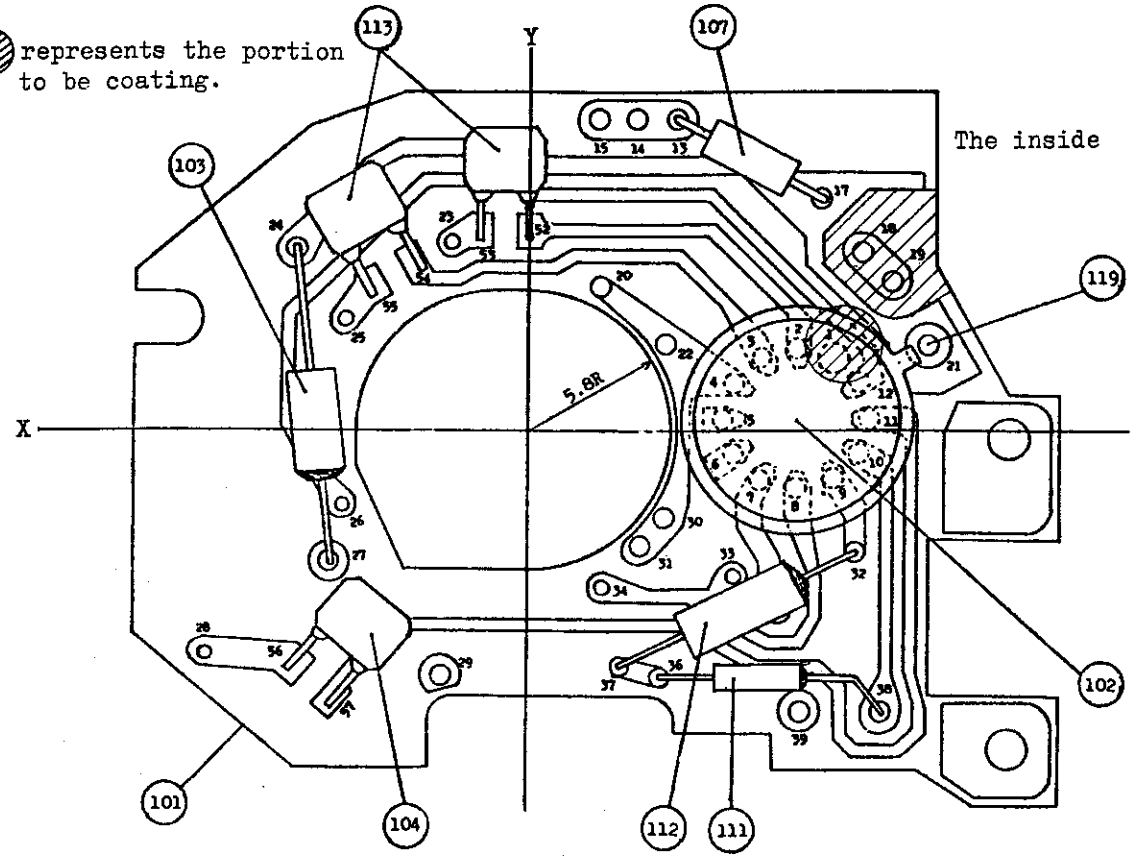
Wiring diagram

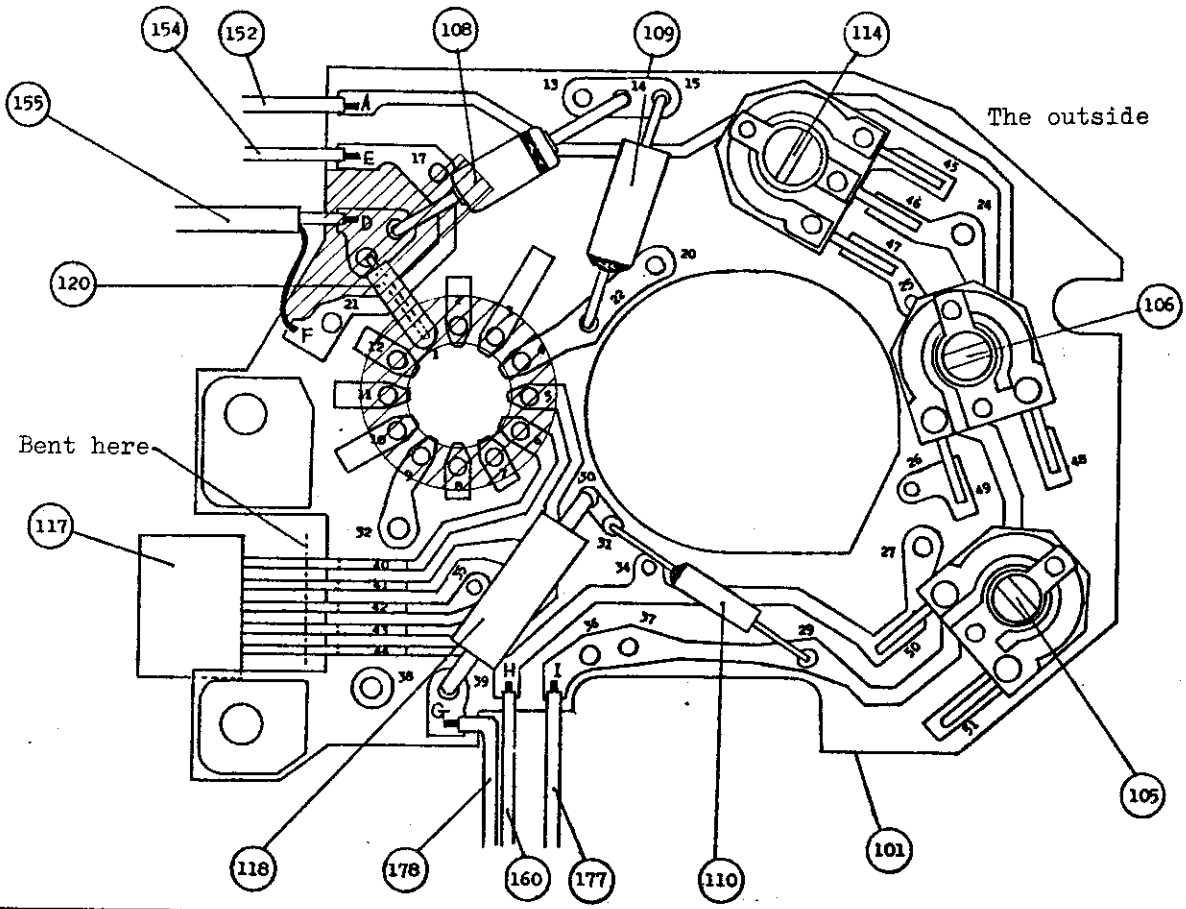


N In soldering, put on cotton gloves.
Soldering iron should be provided with a grounder lead, to prevent electro-static breakdown of IC.

Moisture-proof coating

represents the portion to be coating.

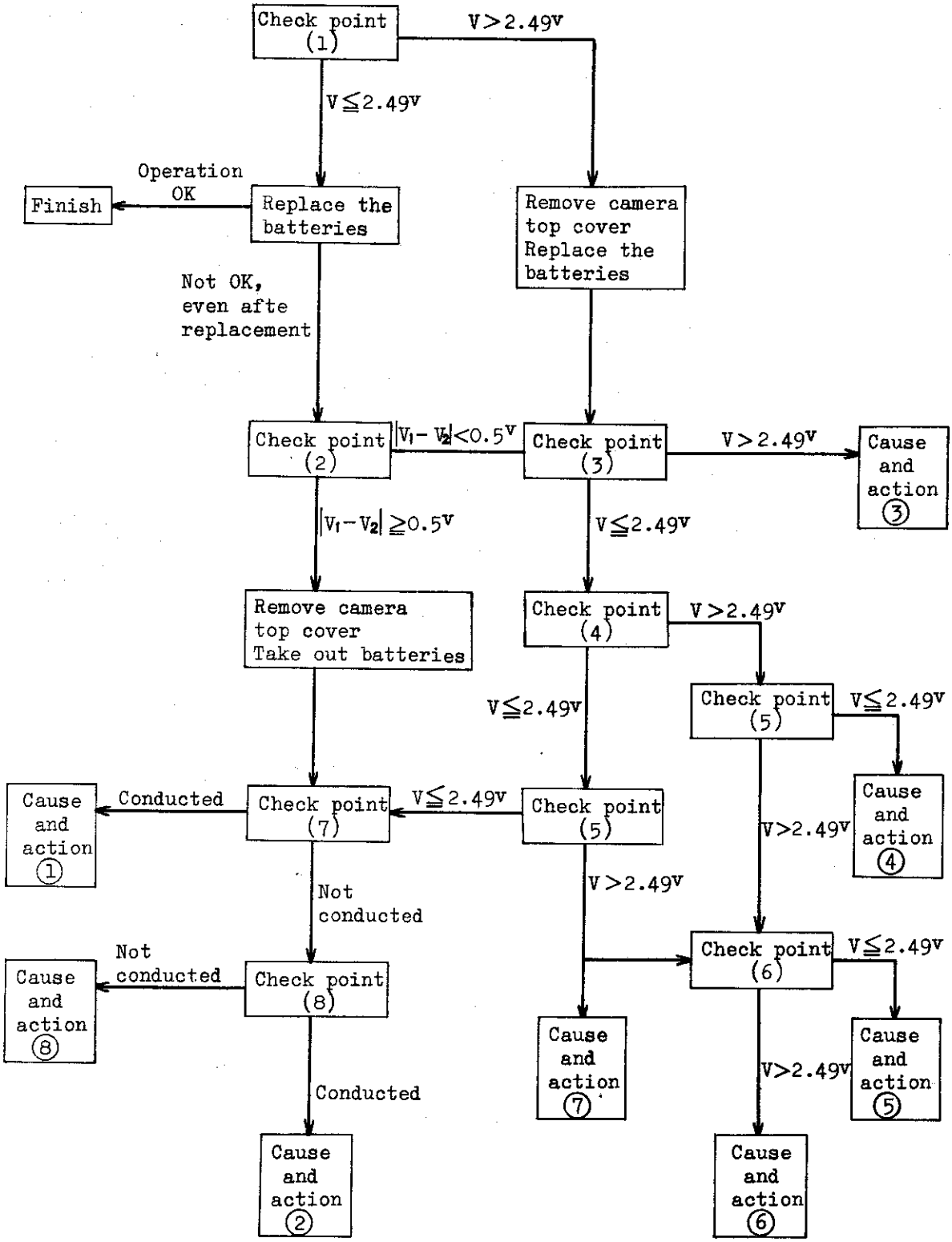




Flow charts and trouble shootings

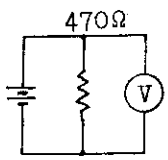
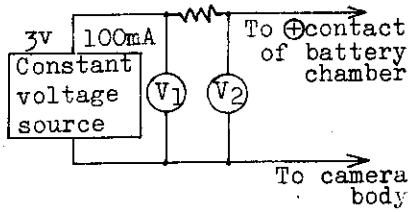
1). None of three LEDs emit light

Flow chart for checking



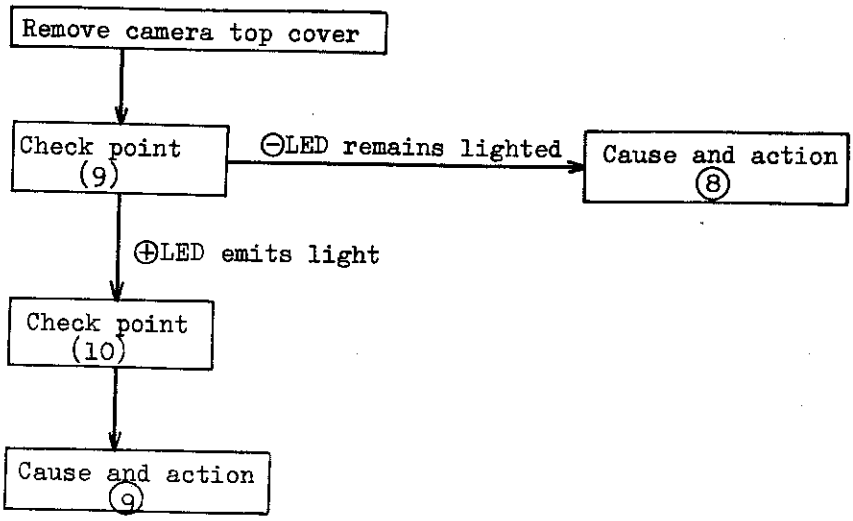
Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
231	Penta-prism retainer ペンタ押え板	1	9		
232	Prism retainer sheet プリズム押えシート	1	9		
233	Prism retaining spring プリズム押えバネ	2	9	32FB-#264	
237	F-mask plate 枠　板	1	9		
239	Prism retaining sponge ペンタ押えモルト	1	9		
242	Exposure mark film 記号表示フイルム	1	11		
250	Prism box プリズムボックス	1	9,11		
251	Viewfield mask 視野枠	1	9		
252	Spacer 間隔枠	1	9		
253	Prism mask プリズム絞り板	1	9		
258	Photo diode フオトダイオード	2	9		
261	Lens release button pad レンズ着脱ボタン飾り	1	11	32FB-#269	
281	Brake release lever ブレーキ解除レバー	1	12		
282	Brake release shaft ブレーキ解除軸	1	12		
283	Collar ブレーキ解除軸カラー	1	12		
284	Brake middle-lever base 中間レバー座金	1	12		
285	Brake spring base 後ブレーキばね基板	1	12		
286	Brake spring 後ブレーキバネ	1	12		

Trouble shooting correspond to chart-1)

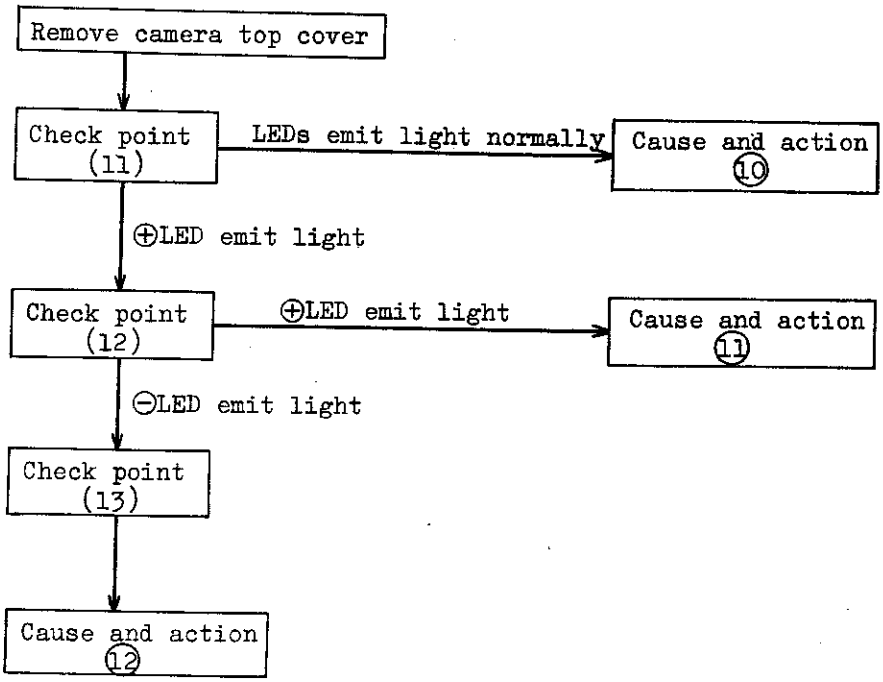
	Check point
(1)	Make sure of voltage of battery, using the circuit as shown below  Note: Use such a voltmeter as of impedance 50kΩ or higher
(2)	Make sure of disconnection or short of lead wires by measuring V_1 and V_2, using the circuit as shown below, with lever switch turned ON 
(3)	Check the voltage between land Ⓗ and Ⓘ (grounded). Use new batteries, with lever switch turned ON
(4)	Check the voltage between land Ⓖ and Ⓘ (grounded). Use new batteries, with lever switch turned OFF
(5)	Check the voltage at MD socket pin E_1
(6)	Check the voltage at MD socket pin E_2, with lever switch turned ON
(7)	Check the conduction between the end of yellow lead (#160) removed from land Ⓗ and land Ⓘ (With lever switch OFF)
(8)	" (With lever switch ON)

	Cause	Action
①	Contact of yellow lead (#160) or orange lead (#176) with body, caused by peeling off of the insulation	Replacement of yellow lead (#160) or orange lead (#176)
	Contact of soldered part of E_2 with body	Remove such contact
	Contact of switch contact A (#487) with body	Remove such contact
②	Contact of red lead (#151), (#161) or (#178) with body, caused by peeling off of the insulation	Replacement of #151, #161 or #178
	Contact of soldered part of E_1 with body	Remove such contact
	Contact of switch contact B (#488) with body	Remove such contact
	Contact of soldered part of battery ⊕contact B (#49) with body	Remove such contact
③	Poor printed circuit	Replacement of printed circuit
④	Disconnection of red lead (#161)	Replacement of the lead #161
	If red lead (#161) is conducting, poor soldering of battery ⊕contact B (#49) or of E_1 conseivable	Resoldering of #161 or E_1
⑤	Disconnection of orange lead (#176) or red lead (#151)	Replacement of #176 or #151
	Poor contact of lever SW contacts (#487 and #488)	Replacement of the contact
⑥	Disconnection of yellow lead (#160)	Replacement of the lead #160
	If #160 is conducting, poor soldering of E_2 conseivable	Rescldering of E_2
⑦	Disconnection of red lead (#178)	Replacement of the lead #178
	If #178 is conducting, poor soldering of battery ⊕contact B (#49) conseivable	Resoldering of the contact B
⑧	Poor printed circuit	Replacement of printed circuit

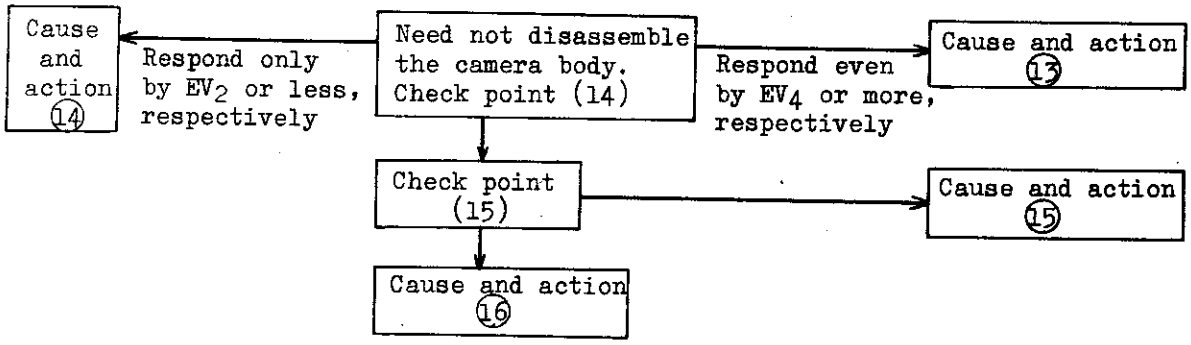
2). ⊖LED remains lighted



3). ⊕LED remains lighted



4). ⊕ and ⊖LEDs respond to a brightness, respectively


Cause and action (14)
Respond only by EV_2 or less, respectively
Need not disassemble the camera body. Check point (14)
Respond even by EV_4 or more, respectively
Cause and action (13)
Check point (15)
Cause and action (15)
Cause and action (16)

Trouble shooting correspond to chart-2)

	Check point
(9)	Try short of pink lead #152 and soldered part of FRE printed sheet (#572) to body (0V)
(10)	Measure the resistance between soldered part of #572 and body (Lever switch turned OFF)

	Cause	Action
⑨	Poor printed circuit	Replacement of printed circuit
	Disconnection of pink lead (#152)	Replacement of the lead #152
⑩	Poor contact of FRE brush	Replacement of the poor brush

Trouble shooting correspond to chart-3)

	Check point
(11)	Check lighting of LEDs, after making sure of no contact of soldered part of FRE printed sheet (#572) with body (Lever switch turned ON)
(12)	Check lighting of LEDs, after removing pink lead (#152) from soldered part of #572 to open the circuit
(13)	Measure the resistance between soldered part of FRE printed sheet (#572) and body, at ASA 100 and shutter speed 1/1000sec.

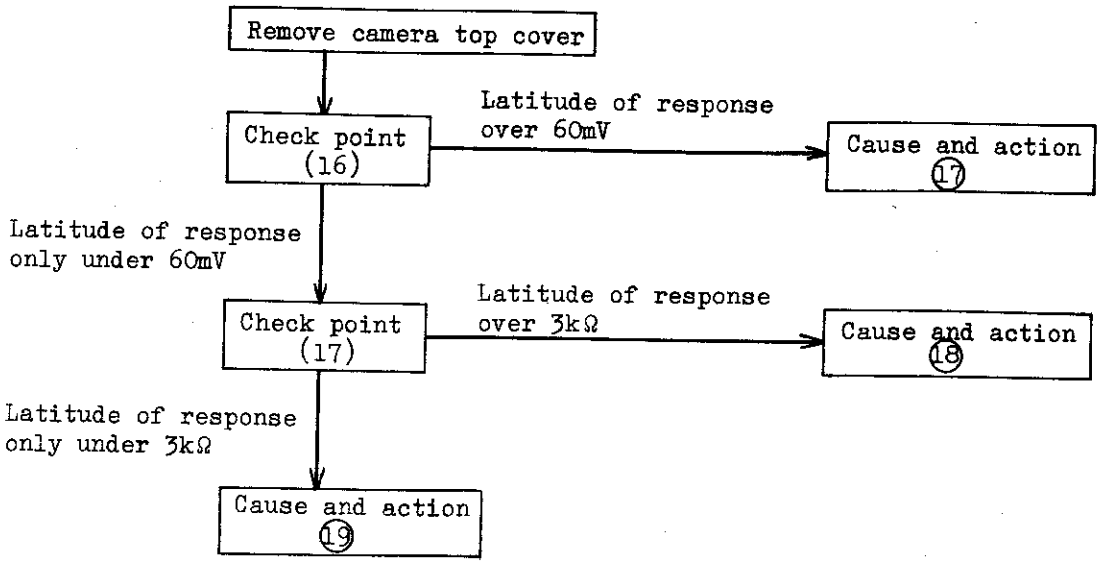
	Cause	Action
⑪	Contact of soldered part of #572 with body and with camera top cover	Remove such contact
⑫	Poor printed circuit	Replacement of printed circuit
	Contact of pink lead #152 with body, caused by peeling off the insulation	Remove such contact
⑬	Short of FRE to body	Improvement of short part of FRE

Trouble shooting correspond to chart-4)

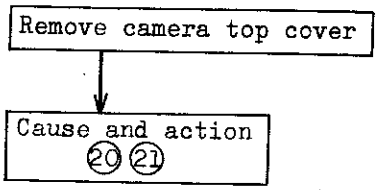
	Check point
(14)	Check that LEDs respond to the change of brightness
(15)	Check the conduction between camera body and top cover

	Cause	Action
⑭	Rising of FRE brush	Replacement of FRE
⑮	Poor printed circuit	Replacement of printed circuit
⑯	Poor printed circuit	Replacement of printed circuit
⑰	Insufficient shield effect	Make conduction perfect between body and top cover

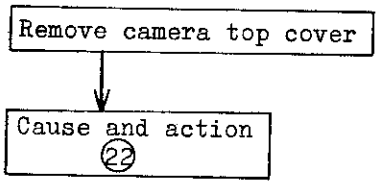
5). Even though exposure factors are fully altered, LEDs respond only to such an extent as ⊖→⊖◎ or ⊕→⊕◎


Remove camera top cover
Check point (16)
Latitude of response over 60mV
Cause and action 17
Latitude of response only under 60mV
Check point (17)
Latitude of response over 3kΩ
Cause and action 18
Latitude of response only under 3kΩ
Cause and action 19

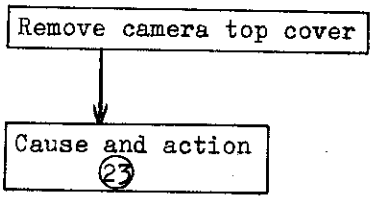
6). All of three LEDs remain lighted



7). Only one or two of three LEDs emit light



8). LEDs do not respond to the brightness in the normal sequence



Trouble shooting correspond to chart-5)

	Check point
(16)	Measure the voltage between pink lead (#152) and soldered part of FRE printed sheet (#572) by turning T-dial, at ASA 100, f/5.6
(17)	Measure the resistance between soldered part of FRE printed sheet (#572) and body by turning T-dial, at ASA 100, f/5.6

	Cause	Action
⑱	Poor printed circuit	Replacement of printed circuit
⑲	Poor printed circuit	Replacement of printed circuit
⑳	Incorrect resistance of FRE	Readjustment of FRE

Trouble shooting correspond to chart-6)

	Check point
	———

	Cause	Action
㉑	Solder bridge on LED lead or oscillation of IC, etc.	Replacement of printed circuit
㉒	Poor conduction between camera top cover and body	Make positive the conduction

Trouble shooting correspond to chart-7)

	Check point
	———

	Cause	Action
㉓	Poor LED or printed circuit	Replacement of printed circuit

Trouble shooting correspond to chart-8)

	Check point
	———

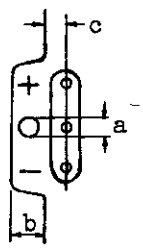
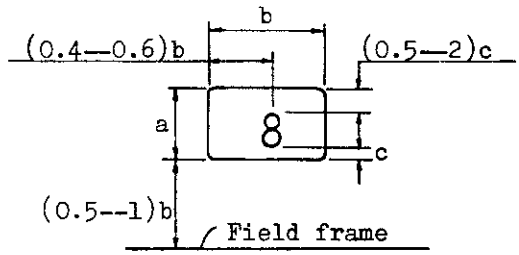
	Cause	Action
㉔	Poor printed circuit	Replacement of printed circuit

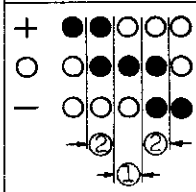
8. INSPECTION STANDARDS FOR REPAIRING

Item	Psition	Subject	Tool
Winding-up and shutter release	Wind-up lever	Wind-up torque: Within 1.5kg·cm (with no film), Within 4.5kg·cm (with film loaded)	Torque meter
	Spool	Torque of spool: 200—250g	Counter weight
	Sprocket	Slack of sprocket (at wind-up limit): Within 0.8mm at the top of tooth	(Manual)
	Wind-up coupling	Wind-up angle At start : -1°—+2° At wound-up: 132°—138°	Exclusive angle gauge
		Wind-up torque: Equal to that of wind-up lever, or less	Torque meter
	Rewind button	To be set in the position pushed 2.7mm from bottom cover surface	
	Rewind knob	Friction torque (with no film): 25—40g·cm	
	Shutter release button	Force required for releasing: 250—400g Stroke: 2.5±0.3mm (Releasing should be done, when the top surface of the button is pushed down over 0.4mm from that of cover ring	Micrometer for shutter button
	MD releasing shaft	Height of shaft from the surface of bottom cover : $0.7^{+0.3}_{-0.2}$mm	
		Force required for pushing shaft: Within 500g	Pressure gauge
		Stroke of releasing shaft (from the surface of bottom cover): 3.4mm or less	Height gauge
Shutter	Exposure time	Time allowance (ms)	Shutter tester

Speed (sec.)	Upper limit	Specified	Lower limit
1	1320	1000	755
1/2	660	500	377
1/4	330	250	188
1/8	165	125	94
1/15	82.5	62.5	47
1/30	41.25	31.25	23.5
1/60	20.62	15.63	11.7
1/125	12.1	7.81	5.05
1/250	6.06	3.81	2.52
1/500	3.03	1.95	1.26
1/1000	1.51	0.98	0.63

Time difference in high speed	Difference of the exposure time between 1/500 and 1/1000sec. should be 0.35ms or longer (at the center of picture frame)	
Unevenness of exposure	Difference between max. and min. of exposure at the start, center and finish of picture should be 0.25EV or under (At speed 1/1000sec.)	

Item	Position	Subject	Tool
Shutter (continued)	Shutter dial	Click torque: 600—900g·cm	(Manual)
	Curtain speed	First curtain: Within 7ms (at 1/125sec.) Second curtain: " " (")	Shutter tester
	Self-timer	Time of running: 8—14sec. After setting, if returned to the start position, it should be cancelled	Stop watch
	X-contact syncronization	Time lag: 0.3—0.8ms	
		Contact efficiency: 70% or more (Specified: 1ms)	Contact efficiency meter
		Insulation: 30MΩ or higher	Megger
Viewfinder	Infinity (∞) coincidence	Coincidence: ±30″ (with sprit prism) Out of focus in the four corners of viewfield should not remarkable	Tool lens and collimator
	Parallax	Parallax on picture plane: Within 0.5mm (In vertical and horizontal directions at the center of the field)	
	Viewfield-ratio	Vertical 93% or larger, horizontal 93% or larger, at the center of the field	
	Field frame	Inclination: Within 1° 30′ (As compared with chart)	
	Position of LED indicator	Center LED should be within the range shown a. The dimension shown b should not extend too far over. 	With the eye
	Position of T-figure	No missing, displacement and tilting of the figures and B are permissible. The edge of T-film should not enter too far the field frame. 	With the eye
	Position of F-figure	 No remarkable tilting of F-figure window respective to field frame is permitted.	With the eye

Item	Position	Subject	Tool
Exposure indication	ASA setting	ASA dial should be able to set to 12 at f/1.4 with Bulb and 3200 at f/22 with 1/1000sec.	With the hand
	Indication accuracy (with 50mm/1.4 lens and ASA100)	Brightness (Cd/m²) 2 8 64 256 4096 EV 4 6 9 11 15 f/ 2.8 2.8 4 4 8 T (shutter speed) 1/2 1/8 1/30 1/125 1/500	K = 1.6 Brightness-box Tool lens
		 Zone ①, Correct exposure point ±0.5EV Dead zone: 0.3—0.6EV Zone ②, Two-LED lighting range: 0.7—1.1EV	
		Note: Correctness of the above EV ranges is judge by the change-over of lighting obtained by turning the aperture ring in the direction of the arrows.	With aperture ring
		Extingish voltage: 2.1—2.49V	
Lens mount	Aperture coupling lever	Height of the lever from camera center: After winding-up..... 3.1 ±0.1mm Before winding-up..... Within 3.5mm Difference between before and after winding-up..... 0.15mm or larger	Exclusive tool
		Stroke of the lever: 7.1mm or larger	
		Force for pushing the lever (at height 3.1mm): 90—120g	
	Aperture coupling ring	Rotating angle of coupling piece: 52.5°—112.5°	
		Rotation torque: In the direction of stopping-down, 0.400—750g·cm In reverse direction, 0.100—350g·cm	
	Metal back focus	Distance: 46.67 ±0.02mm(from outer rail)	
		Parallelism: 0.02mm	
		Level difference between out- and inside rail: 0.23 +0.02mm	
Camera back	Pressure plate	Flatness: Within 0.02mm	

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
289	Mirror latch spring ミラー係止ばね (t=0.2)	1	10		
291	Latch lever axle 係止レバー軸	1	10		
302	Mirror shaft 巻上側チリトリ回転軸	1	10		
303	Mirror shaft 巻上側チリトリ回転軸	1	11		
313	Stop-down lever spring 手動絞りレバーバネ	1	10		
314	Stop-down lever screw 絞りレバービス	1	10		
320A	Charge lever axle チャージレバー軸	1	13	31F3B-#317	
320	Collar シャッターレリーズレバーカラー	1	10		
321	Shutter release lever シャッターレリーズレバー	1	10		
328	Signal lever シグナルレバー	1	10		
329	Mirror-up stop lever ミラーアップ押えレバー	1	10		
330	Mirror-down latch lever ミラーダウン係止レバー	1	10		
331	Mirror-up stop lever axle ミラーアップ押えレバー軸	1	10		
334	Mirror charge lever axle 大レバー軸	1	12		
336	Bottom light baffle 底遮光板	1	9		
340	Spring 絞りレバーバネ (d=0.32)	1	10		
341	Spring ミラーアップバネ (d=0.29)	1	10		
342	Middle lever stopper 中間レバー制限	1	12		

Part No. 部品番号	Name 名称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備考
343	Spring ダウンバネ(d=0.8)	1	12		
344	Mirror-down lever screw レバー押えビス	1	10		
348	Spring (d=0.26) シャッターレリーズバネ	1	10		
349	Spring (d=0.26) ミラーアップ押えバネ	1	10		
355	Spring (d=0.26) ブレーキレバー戻しバネ	1	12		
357	Signal lever screw シグナルレバー止メビス	1	10		
361	Spring stud ミラーアップ押え レバーバネ掛け	1	10		
367	Down lever eccenter 調整レバー偏心軸	1	12		
368	Down lever adjuster axle ダウンレバー調整レバー軸	1	12		
370	Brake spring screw 後ブレーキバネ止めビス	1	12		
372	Cushion rubber 防振用ゴム	1	10		
374	Collar ミラー巻戻側カラー	1	11		
375	Washer ミラー巻上側ワッシャー	2	11		
378	Mirror spring ミラースプリング (大)	1	10		
379	Mirror spring ミラースプリング (小)	1	10		
383	Air damper lever エアダンパー駆動レバー	1	11		
385—1	Damper pin エアダンパー駆動 受けピン	1	11		-3
386—1	Damper connecting pin エアダンパー連接ピン	1	11		-3

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
387—1	Air damper piston エアダンパーピストン	1	11		-3
393—1	Sylinder cover (B) エアダンパーシリンダー蓋 (B)	1	11		
394	Air damper holder エアダンパーホルダー	1	11		
395	Damper lever screw エアダンパー駆動レバー止めビス	1	11		
397	Damper packing rubber エアダンパーゴム	1	11		
402	Wind-up lever leatherette 巻上レバー用皮	1	1		
403	Wind-up lever screw レバー押えねじ	1	1		
404A	Counter retaining ring 枚数計押え板	1	2		
405	Wind-up lever axle nut レバー軸ナット	1	2		
406	Spring レバー戻しバネ(d=0.35)	1	2	32FB-#406-2	
408	Wind-up lever axle 巻上軸	1	2		
408A	Sprocket release plate スプロ制限解板	1	2		
411	Click lever クリックレバー	1	2		
412	Claw spring 羽根爪押えばね	3	3		
413	Cam 巻上げカム	1	3		
416	Idle gear A アイドルギヤA	1	3		
417	Idle gear B アイドルギヤB	1	3		
421	Spool top gear nut スプール上ギアナット	1	4	32FB1-#429A	

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
427	Washer (3.5×5.8×0.5) アイドルギアAワッシャ	1	3		
427A	Washer (2.1×4×0.2) 偏心軸ワッシャ	1	3		
429	Sprocket stopper cam スプロケット制限カム	1	4		
430	Washer (7×9.8×0.3) スプール上ギアワッシャー	1	4		
431	Sprocket upper gear スプロ上ギア	1	4		
432	Sprocket shaft bearing スプロケット軸受	1	4		
433	Sprocket collar スプロケットカラー	1	4		
434	Sprocket shaft スプロケット軸	1	4		
435	Sprocket screw スプロケットビス	2	4	32FB-#834-1	
436	Sprocket collar A スプロケットカラー A	1	4		
437	Sprocket collar A nut スプロカラーAナット	1	4		
438	Sprocket shaft bearing スプロ軸受	1	4		
439	Rewind button 巻戻し釦	1	14		
441	Charge cam claw release lever axle 三羽根爪外しレバー軸	1	13		
450	Spring スプロストッパー戻しばね	1	3		
456-1	Friction plate フリクション板	1	4	32FB-#434	-3
456A	Friction spring フリクションバネ	1	4	32FB-#433	-3
456B	Spring tray バネ受け皿	1	4	32FB1-#433A	

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
456C	Spring tube バネ押え筒	1	4	32FB1-#499	
460	Collar セットカムカラー	1	4,14	32FB-#491-1	
462	Pendulum 振り子	1	14		
463	Spring stud 振り子バネ軸	1	14		
464	Lock lever ロックレバー	1	14		
465	Spring (d=0.26) ロックレバーバネ	1	14		
467	Collar ゆるみ止めカラー	1	4		
468-1	Release button ring レリーズボタン飾り環	1	1		-4
470	Release button plunger レリーズ内筒	1	1		
473	MD switch stopper axle スイッチ制限軸	1	2		
476	Spring スイッチ制限バネ	1	2		
478-1	Click lever クリックレバー	1	1		-4
483	Click lever spring クリックレバーバネ	5	2		
485	Switch lever collar スイッチレバーカラー	1	2		
487	Lever switch contact A 主スイッチ切片A	1	3		
488	Lever switch contact B 主スイッチ切片B	1	3		
489	Charge cam claw release lever 三羽根爪外しレバー	1	13		
490	Multi-exposure arm A 多重取りアームA	1	13		

Part No. 部品番号	Name 名称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備考
490A	Multi-exposure knob washer 多重ツマミ保護シート	1	1		
491	Multi-exposure knob 多重取りツマミ	1	1		
492	Spring (d=0.3) 多重取りアーム戻しバネ	1	13		
494	Guide pin ガイドピン	1	13		
494A	Spring stud 多重戻しバネ掛け	1	2		
495	Wind-up lever knob 指あて	1	1	32FB-#416	
496	Sprocket stopper spring スプロ制限板バネ	1	3		
498	Sprocket spring スプロケットバネ	1	4	32FB-#444	
499	Sprocket shaft collar-B スプロケット軸カラーB	1	4	32FB-#449-2	
499A	" -C スプロケット軸カラーC	1	4	32FB-#449C	
502-1	Frame counter dial 枚数計	1	2		-4
503	Counter window 枚数計窓	1	1	32FB-#503	
505	Spring カウンターバネ(d=0.6)	1	2		
506	Ratchet claw 止爪	1	2		
507	Claw nut 止爪ナット	1	2		
508	Claw collar 止爪カラー	1	2		
512	Advance claw lever axle 送り爪レバー軸	1	2		
514	Collar 送り爪レバー軸カラー	1	2		

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
516	Counter eccenter axle カウンター送り偏心軸	1	3		
518A	Release lever fork レリーズレバー二又	1	10		
519	Relèase lever axle レリーズレバー軸	2	10		
520	Washer (1.5×5.2×0.2) 零戻しバネワッシャー	1	2		
521	Spring 零戻しバネ(d=0.26)	1	2		
523	Counter reverse lever axle 零戻しレバー軸	1	2		
526	Click lever damper クリックレバーあおり止め	1	2		
527	Release shaft レリーズ軸	1	14.13		
527A	Release middle shaft レリーズ軸補助	1	13		
527B	Spring (d=0.12) レリーズ釦補助バネ	1	13		
531	Sprocket スプロケット	1	4		
532-1	Ratchet ラチエット	1	2		-4
533	Frame counter index 指 標 板	1	2		
534	MD switch cover plate スイッチ押え板	2	2,3		
535A	Release button レリーズボタン	1	1	32FB-#459	
535C-1	Release button nut レリーズ 釦ナット	1	1		-4
535D	Release button nut レリーズ釦ナット	1	1		-4
536	Spring レリーズ軸バネ	1	13	32FB-#475	

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
537	AR lever ARレバー	1	14	32FB-#479-1	
537A	AR lever axle ARレバー軸	1	14	32FB-#480	
537B	Spring ARレバーバネ	1	14	32FB-#481	
538	Pendulum axle 振り子軸	1	14	32FB-#483	
538A	Pendulum spring 振り子ばね	1	14	32FB-#484	
539	Lock lever axle ロックレバー軸	1	14	32FB-#487	
540A	Insulating plate MDスイッチ絶縁板	4	2,3		
540B	MD switch base plate MDスイッチ座板	1	2		
541	T-dial シャッター目盛板	1	5		
541A	Adjusting washer 調整ワッシャー	1	5		
542	ASA dial ASA目盛板	1	5		
543	Dial knob ダイヤル外環	1	1		
571	Click pulley クリックプーリー	1	13		
575—1	Cover ring 飾り環	1	1		
576	T-dial string シャッター変速糸	1	13		
577—1	Washer 21×23.5×0.2 ワッシャー	1	1		
578	Dial top screw ダイヤル上面ビス	1	5		
579	Shoulder screw プーリー段ビス	1	13		

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
580	Hole cover ギア調整用孔カバー	1	9		
581	Spring アースばね (d=0.3)	1	5		
582	T—dial pulley Tダイヤルプーリー	1	9		
588	Gear 軸付ギヤ	1	10		
589	Gear bearing ギヤ軸受	1	10		
590	Front pinion 前小ギヤ前小ギヤ	1	9		
594	Spring pin スプリングピン	1	10		
596	FRE stopper FRE制限板	1	5		
599	T-film string Tフイルム糸	1	9		
600	Control unit base screw 基板取付ビスB	1	5		
604	Lug ラグ板	1	5		
618	T-film nut Tフィルムナット	1	9		
623	Spring Tフィルムバネ(d=0.2)	1	9		
624A	Washer (2.2×3.5×0.1) Tフィルム基板座金	1	9		
624B	Washer (2.2×3.5×0.2) Tフィルム基板座金	1	9		
624C	Washer (2.2×3.5×0.3) Tフィルム基板座金	1	9		
624D	Washer (2.2×3.5×0.4) Tフィルム基板座金	1	9		
651	Rewind shaft bearing 巻戻軸受	1	6		

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
652	Rewind shaft 巻戻軸	1	6		
653	Rewind knob 巻戻ノブ	1	6		
655	Spring 開閉ノブバネ(d=0.25)	1	6		
656	Rewind lever spring レバー受バネ	1	6	32FB-#606	
659	Knob clip 開閉ノブ押えクリップ	1	6		
660	Washer 巻戻軸座金	1	6		
661	Cover ring 巻戻飾り板	1	6		
662	Friction spring フリクションバネ(d=0.4)	1	6		
663	Spring 開閉ロックバネ(d=0.5)	1	6		
664	Back cover lock knob 開閉ノブ	1	6		
665	Rewind shaft guide 巻戻軸ガイド	1	6		
666	Rewind lever shaft 巻戻レバー軸	1	6	32FB-#609	
706	Back cover hinge A 裏蓋蝶番A	1	16		
708	Latch B 止め爪B	1	16		
709	Latch cover 止め爪カバー	1	16		
714	Spring (d=0.3) 止めばね	1	15		
722	Hinge bar B 蝶番芯金 B	1	15		
725	Back cover leatherette 裏蓋用貼皮	1	15		

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
726	Light-tight A 遮光モルトA	1	15		
727	Light-tight B 遮光モルトB	1	15		
728	Light-tight C 遮光モルトC	1	15		
729	Light baffle cloth A 遮光別珍A	1	15		
730	Light baffle cloth B 遮光別珍B	1	15		
731	Back cover lock pin 裏蓋着脱ピン	1	15		
732	Spring 裏蓋着脱ばね	1	15	30FB-#629	
801	JCIS ⊕ PM 2×3 Type (3)	4	14,6		
802	JCIS ⊕ PM 2×7 Type (1)	1	16		
803	JCIS ⊕ PM 1.7×3 Type (1)	6	1,8 16	32FB-#803	
804	JCIS ⊕ CM 1.7×2.5 Type (1)	6	14,16	32FB-#804	
805	Screw ⊕ 2×3.6 バヨネット止めビス	4	8	32FB-#805	
806	JCIS ⊕ PM 1.7×1.8 Type (1)	6	8	32FB-#806	
807	Screw ⊕ 2×3 下地板取付ビス	2	3	32FB-#807	
809	JCIS ⊕ CM 2×3 Type (1)	3	14		
810	Screw ⊕ 2×3.5 前板取付ビス	6	9,14	32FB-#810	
811	Screw ⊕ 2×6.7 バヨネット台ビス	4	8	32FB-#811	
812	JCIS ⊕ PM 1.7×2.2 Type (1)	2	2	32FB-#878	

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
815	Screw (left handed) ⊖ 2×3 巻上軸ビス (左)	2	3,4	32FB-#815	
816	JCIS ⊕ PM 2×2 Type (3)	1	10		
817	JCIS ⊕ PM 2×5 Type(3)	4	9,11		
819	JCIS ⊕ PM 1.4×3 Type (3)	4	3,8	32FB-#819	
820	Coupling screw カップリングビス	1	4	32FB1-#932	
821	JCIS ⊕PM 2×4 Type (3)	2	14		
823a	Washer (3.6×6.5×0.05) ミラーレバー軸調整座金	1	10		
823b	" (3.6×6.5×0.1) "	1	10		
823c	" (3.6×6.5×0.15) "	1	10		
823d	" (3.6×6.5×0.2) "	1	10		
824	Gear set screw ギアセットビス	7	1,4	32FB-#824	-4
825	JCIS ⊕ PM 2×2.5 Type (1)	9	4,9,10 11,14		
828	JCIS ⊕ CM 2×3.5 Type (1)	2	9	32FB-#828	
830	JCIS ⊕ PM 1.4×2 Type (3)	2	9		
831	JCIS ⊕ CM 1.4×4 Type (1)	1	2		
832	JCIS ⊕ PM 2×4.5 Type (1)	2	1	32FB-#832-1	
833	Screw (left handed) ⊖ 1.7×3 ゆるみ止めビス	1	4		
834	Screw ⊖1.7×2 チリトリピン押えビス	2	10,11		

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
835	Screw ⊕ 2×3 下地板取付ビスB	1	3		
837	Screw ⊖ 1.4×3 ダイヤルプーリー取付ビス	1	2		
839	JCIS ⊕ PM 1.7×4 Type (3)	1	9	32FB-#839	
840	JCIS ⊕ PM 2×3 Type (3)	2	13	32FB-#840	
841	Snap ring E — 24	1	13	31F3B-#836	
842a	Washer (2.1×3.8×0.05) 調整座金	0～5	9,11	32FB-#842a	
842b	〃 (2.1×3.8×0.06) 〃	〃	9, 11	32FB-#842b	
842c	〃 (2.1×3.8×0.07) 〃	〃	11	32FB-#842c	
842d	〃 (2.1×3.8×0.08) 〃	〃	11	32FB-#842d	
842e	〃 (2.1×3.8×0.09) 〃	〃	11	32FB-#842e	
842f	〃 (2.1×3.8×0.1) 〃	〃	11	32FB-#842f	
842g	〃 (2.1×3.8×0.11) 〃	〃	11	32FB-#842g	
842h	〃 (2.1×3.8×0.12) 〃	〃	11	32FB-#842h	
842i	〃 (2.1×3.8×0.2) 〃	〃	11	32FB-#842i	
842j	〃 (2.1×3.8×0.3) 〃	〃	11	32FB-#842j	
842k	〃 (2.1×3.8×0.4) 〃	〃	11	32FB-#842k	
842m	〃 (2.1× 3.8×0.5) 〃	1	11	32FB-#842m	
842n	〃 (2.1×3.8×0.6) 〃	0-5	11	32FB-#842n	

Part No. 部品番号	Name 名　称	Pos. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
842p	" (2.1×3.8×0.7) "	"	11	32FB-#842p	
842q	" (2.1×3.8×0.8) "	"	11	32FB-#842q	
842r	" (2.1×3.8×0.9) "	"	11	32FB-#842r	
842s	" (2.1×3.8×1.0) "	"	11	32FB-#842s	
842t	Washer (2.1×3.8×1.1)	0~5	11	32FB-#842t	
842u	" (2.1×3.8×1.2) "	"	11	32FB-#842u	
843	Washer (3.2×5.5×0.2) スプロケットバネ受座金	1	4	32FB-#843	
845	JCIS ⊕ PM 2×3 Type (1)	6	2,5 6	32FB-#845	
846	JCIS ⊕ PM 1.4×1.5 Type (3)	2	9		
848	Eyelet set screw つり環ビス	2	13	32FB-#848	
849	Screw ⊕ 1.4×2.5 Tダイヤル基板ビス	1	12	32FB-#849	
850-1	Air damper piston pin エアダンパーピストンピン	1	11		-3
852	Screw ⊖ 1.4×2 ブラシ取付ビス	2	5	32FB-#852	
854	Washer (2.1×5×0.6) ミラーアップ押え レバー座金	1	5,10		
855	JCIS ⊕PM 2×3.5 Type (3)	3	12	32FB-#855	
856	Snap ring E — 10	2	1	32FB-#856	-3
857	Washer (5.5×2.1×0.5) 大レバー座金	2	12		
858	Washer (5×2.2×0.2) ミラーボックス座板	1	10	32FB-#858	

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
861	Click ball シャッタークリックボール	1	13		
862	Screw ⊖ 1.4×1.1 糸押えビス	2	13		
867	SC 1.7×2	1	6		
869	JCIS ⊕ CM 1.4×1.5 Type (1)	3	1		
870	SC 1.4 × 2.5	4	5		
871	JCIS ⊕ CM 2 × 4.5 Type (3)	1	14		
873	JCIS ⊕ PM 1.7×5 Type(3)	2	1		
874	JCIS ⊕ PM 1.7 × 8.2 Type (3)	2	1		
875	SR 1.4 × 2.5	2	9		
877	Release lever axle シャッターレリーズ レバー軸	1	10		
878	Down lever stopper ダウン係止レバーストップ	1	10		
879	Release lever guide pin レリーズレバーガイド軸	1	13		
880	B-lever release screw Bレバー解除ビス	1	13		
882	JCIS ⊕ CM 1.7 × 3 Type (1)	2	16	32FB-#882	
883	Snap ring E - 17	1	14	32FB-#883	
885	Screw ⊖ 1.4 × 2 アイドルギア取付ビス	5	9,10 13		
886	Screw ⊖ 2 × 2.5 中間基板止めビス	1	12		
887	Screw (left handed) ⊖ 1.7 × 2 スプロケット左ネジ	1	4		

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
888	Sprocket stopper screw スプロストッパービス	1	3		
893	Coupling lever spring screw 絞り連動片バネビス	2	8		
895	Pulley mount screw A プーリー 基板取付ビスA	1	13		
896	Pulley mount screw B プーリー 基板取付ビスB	1	13		
897A	Washer (6.5x9.5x0.05) 巻上ギアワッシャー	0～1	3		
897B	Washer (6.5x9.5x0.1) 巻上ギアワッシャー	0～1	3		
897C	Washer (6.5x9.5x0.2) 巻上ギアワッシャー	0～1	3		
904	MD switch contact A MDスイッチ接片A	1	2		
905	MD switch contact B MDスイッチ接片B	1	2		
910	MD coupling shaft bearing MD軸受	1	14		
911	MD coupling shaft MD軸	1	14		
912	MD seesaw lever MDシーソーレバー	1	14		
913	Release coupling screw レリーズ連結ネジ	1	14		
914	MD seesaw lever axle MDシーソーレバー軸	1	14		
923	MD coupling モーターカップリング	1	14		
924	Insulator 絶縁シート	1	14		

Part No. 部品番号	Name 名　称	Pcs. Per Unit 1台当り個数	Reference Fig. No. 参照図番	Common Part No. 共通部品番号	Remarks 備　考
G2	Fresnel-lens フレネル	1	9		
G3	Panta—prism ペンタプリズム	1	9		

No. of Subassem. 部組番号	Name 名称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common No.of Subassembly 共通部組番号	Remarks 備考
A2	Eyelet つり環	2	13		
A3	MD switch coupling lever MDスイッチ連動レバー	1	13		
A4	Shutter charge lever シャッターチャージレバー	1	4		
A5	Battery chamber 電池ケース	1	13		
A6	Charge lever チャージレバー	1	13		
A7	Spool top gear スプール上ギア	1	4		
A8	Spool スプール	1	4		
A9	Spool shaft スプール軸	1	4		
A10	Set cam セットカム	1	4		
A11	Lower bracket 下地板	1	3		
A12	Sprocket stopper スプロストッパー	1	3		
A14	Spool shaft bearing スプール軸受ケース	1	4		
A17	MD remote socket MD外部接点	1	14		
A18	Wind-up gear 巻上ギア	1	4		
B	Front plate 前板部	1	8 9 11,12		
B1	Self-timer lever セルフ作動レバー	1	9		
B2	Self-timer coupling lever セルフ連動レバー	1	9		
B3	Lens mount マウント台	1	8		
B4	Aperture coupling ring 絞り連動環	1	8		

No. of Subassem. 部組番号	Name 名称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common No. of Subassembly 共通部組番号	Remarks 備考
B5	Lens release lever 着脱レバー	1	8		
B6	Lens release button 着脱ボタン	1	11		
B10	Stop-down coupling lever 絞りレバー	1	10		
B11	Mirror charge lever 大レバー	1	12		
B12	Mirror-up lever ミラーアップレバー	1	10		
B13	Mirror-down lever ミラーダウンレバー	1	10		
B14	Mirror-down signal lever ミラーダウン信号レバー	1	10		
B16	45° stopper 45° ストッパー	1	9		
B17	Mirror lever base plate ミラーレバー軸取付板	1	10		
B18	Middle lever base plate 中間レバー基板	1	12		
B19	Release lever レリーズレバー	1	10		
B20A	Air damper cylinder エアダンパーシリンダー	1	11		
B20B	Air damper piston エアダンパーピストン	1	11		
B21	Down lever adjustor ダウンレバー調整レバー	1	12		
B26	Mirror holder ミラーテリ取り	1	11		
B27	Stop-down coupling lever 手動絞りレバー	1	10		
B28	Idle gear base plate アイドルギア基板	1	10		
B30	Front cover 前カバー銘板	1	8		
B32	Stop-down lever 絞り込みレバー	1	10		
B33	Spring holder 絞りレバーバネ掛け	1	10		

No. of Subassem. 部組番号	Name 名称	Pcs. Per Unit 1台分個数	Reference Fig. No. 参照図番	Common No.of Subassembly 共通部組番号	Remarks 備考
C－1	Top cover 上蓋	1	1		-4
C1	Shoe mount mold シュー座モールド	1	1		
C2	Accessory shoe 付属品取付座	1	1		
C3－1	Release button cover ring かぶせレリーズ環	1	1		-4
C4	Eypiece frame 接眼枠	1	1		
D	Bottom cover 底蓋	1	14		
E1	Back cover 裏蓋	1	15		
E2	Pressure plate 圧板	1	15		
F	Functional control 管制部	1	5		
F7	T-dial pulley Tダイアルプーリー	1	9		
F10	T-film base plate フィルム基板	1	9		
F11	T-film boss フィルムボス	1	9		
H1	Rewind lever 巻戻しレバー	1	6		
K	Upper bracket 上地板	1	2		
K4	MD switch lever スイッチレバー	1	2		

No. of Subassem. 部組番号	Name 名称	Pcs. per Unit 個数	Reference Fig. No. 参照図番	Common No. of Subassembly 共通部組番号	Remarks 備考
K5	Advance claw 送り爪レバー	1	2		
K6	Counter reverse lever 零戻しレバー	1	2		
L	Eyepiece lens 接眼レンズ	1	9		
M	IC printed circuit IC プリント板	1	7		
N1	F-mirror holder ミラー保持板	1	9		
N2	Penta prism retainer ペンタ押え	1	9		
N3	F-mirror adjustor ミラー調整板	1	9		
N4	Eyepiece mold 接眼モールドメガネ	1	9		
P3	Wind-up lever 巻上レバー	1	1		
P4	MD switch stopper スイッチ制限	1	2		
P5	Battery chamber cap 電池キャップ	1	14		

4. SPECIFICATIONS, DRAWINGS AND PARTS LIST

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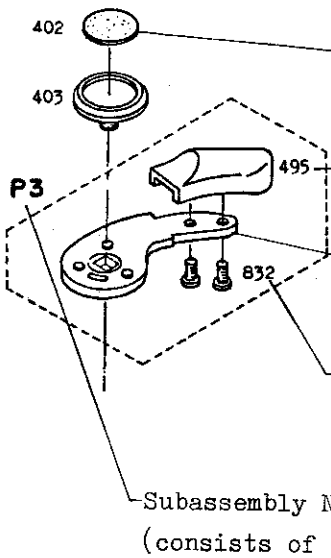
Note:

Parts and subassemblies illustrated in the exploded drawings are listed on the righthand pages.

Parts and subassemblies in this list are all available on order.

The Exploded Drawings are represented in the following way:



(consists of the parts enclosed with dashed line)

Item	Supply	Earlier marking
With part No., but not enclosed with dashed line	Supplied as part individually	○
With part No., and enclosed with dashed line	Supplied as part individually and also as subassembly	○△
Without part No., but enclosed with dashed line	Supplied only as subassembly	△

4. SPECIFICATIONS, DRAWINGS AND PARTS LIST

(1) Specifications

Type of camera: 35mm focal-plane single-lens reflex camera with built-in exposure meter

Film to be used: 35mm cartridge film

Picture frame size: 24mm × 36mm

Standard lens: AI-lens Nikkor 50mm f/1.4, 50mm f/1.8 or 55mm f/1.2

Lens mount: Nikon F mount

Full aperture exposure compensation: Automatic

Shutter: Metal focal-plane, vertical-run type
B and 1 — 1/1000sec.

Self-timer: Built-in

Viewfinder: Eye-level type, field-ratio 93%, vertically and horizontally

Indications in the finder viewfield: Shutter-speed, lens-aperture and 3-signal lights (LEDs) exposure indication

Focusing screen: Matte fresnel field with split-image spot surrounded microprism (type K)

Mirror: Quick return

Depth-of-field preview: Stopped down by lever

Film wind-up lever: Single stroke with working angle 135° and clearance angle 30°

Motor-drive link-up: Capable with Motor Drive MD-11 attached by tripod socket

Multiple exposure: Possible by manipulating the knob

Picture-frame counter: Additive counter, automatic resetting

Film rewinding: Crank type with automatic-return rewind button

Exposure meter: TTL center-weighted. Light receiving element photo-diodes, 3-point 5-step indication by LEDs. Metering range: EV 1—EV 18 at ASA 100 with f/1.4 lens (e.g. with 50mm f/1.4 lens, 1sec. at f/1.4 to 1/1000sec. at f/16)

Power source: Two silver-oxide batteries, each 1.5V

Metering switch: Turned ON by film wind-up lever

Motor driving switch: Coupled to shutter release button ring

Battery check: By lighting LED with meter switch turned ON

Film-speed range: ASA 1.2 — 3200

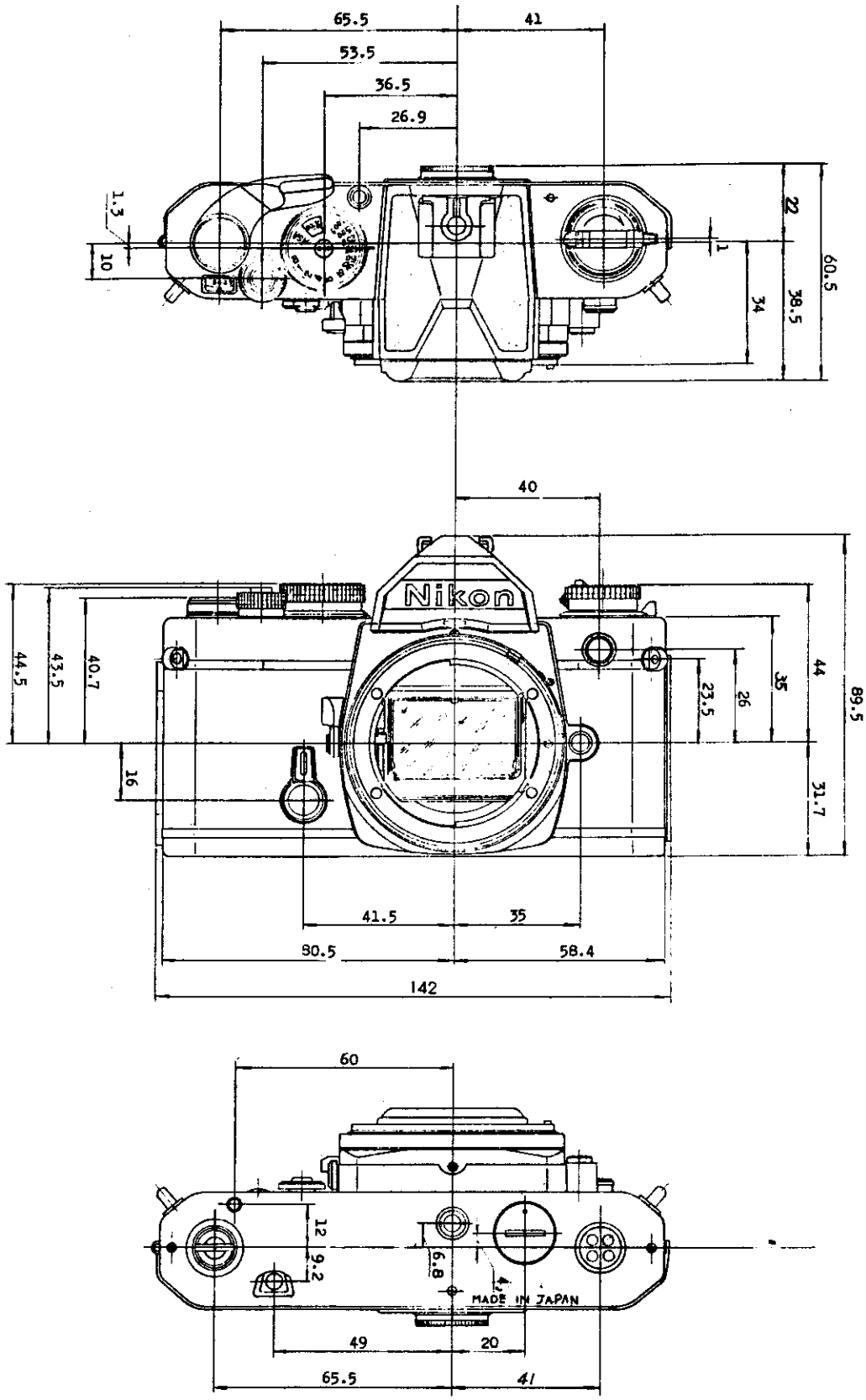
Synch socket: X-contact only (synchronized with 1/125sec. or slower)
Provided with hot shoe

Camera back: Hinge opened after lifting up the rewind knob, with safety lock. Detachable. Provided with memo-holder

Dimensions: 142mm(width) × 60.5mm(depth) × 89.5mm(height)

Weight: About 590g (without lens)

(2) Figure of external 外観図



Top cover
上カバー

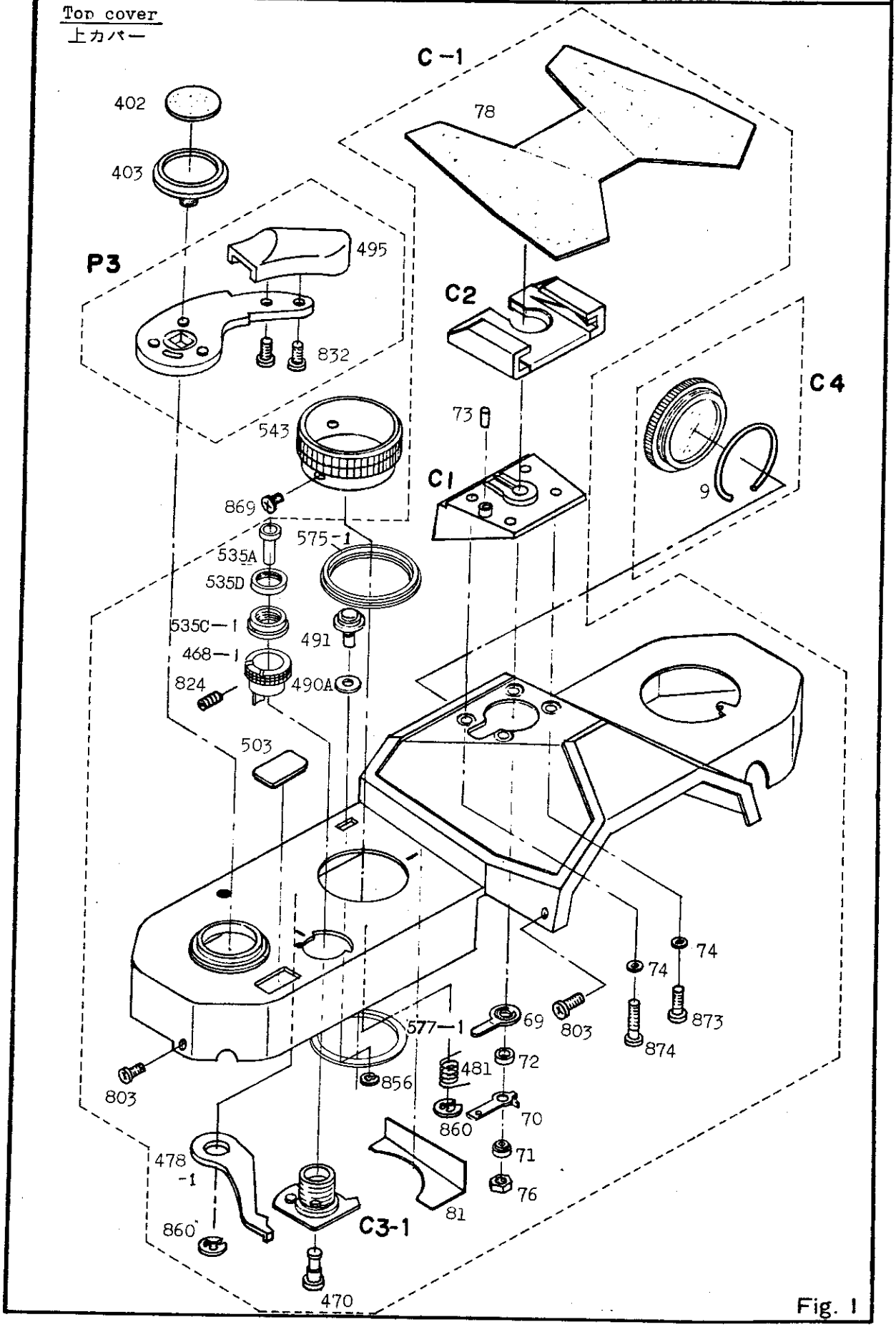


Fig. 1

Part No. 部品番号	Name 名称	Remarks 備考
9	Eypiece glass clip 接眼ガラス押えばね	32FB-#392
69	Shoe switch contact, upper 押え接点	31F3B -#571
70	" , lower 受接点	" -#572-1
71	Collar Dカラー	" -#573
72	Contact washer 接点座金	" -#574
73	Switch plunger 押　棒	" -#575
74	Shoe washer シュー座金	" -#576
76	Sync socket nut シンクロ接点ナット	
78	Penta-prism cover leatherette ペンタ革	
81	FRE insulator FREシート絶縁	
402	Wind-up lever leatherette 巻上レバー用皮	
403	Wind-up lever screw レバー押えねじ	
468—1	Release button ring レリーズボタン飾り環	
470	Release button plunger レリーズ内筒	
478	Click lever クリックレバー	
481	Spring (d=0.4) クリックレバーバネ	
490A	Multi-exposure knob washer 多重ツマミ保護シート	
491	Multi-exposure knob 多重取りツマミ	

Part No. 部品番号	Name 名称	Remarks 備考
495	Wind-up lever knob 指あて	32FB-#416
503	Counter window 枚数計窓	32FB-#503
535A	Release button レリーズボタン	32FB-#459
535C—1	Release button nut レリーズ釦ナット	
543	Dial knob ダイヤル外環	
575	Cover ring 飾り環	
577—1	Washer 21x23.5x0.2 ワッシャー	
803	JCIS ⊕ PM 1.7×3 Type (1)	32FB-#803
832	JCIS ⊕ PM 2×4.5 Type (1)	32FB -#832-1
856	Snap ring E — 10	32FB-#856
860	Snap ring E — 13	32FB-#860
869	JCIS ⊕ CM 1.4×1.5 Type (1)	
873	JCIS ⊕ PM 1.7×5 Type(3)	
874	JCIS ⊕ PM 1.7 × 8.2 Type (3)	
P3	Wind-up lever 巻上レバー	
C4	Eypiece frame 接　眼　枠	
C3	Release button cover ring かぶせレリーズ環	
C2	Accessory shoe 付属品取付座	
C1	Shoe mount mold シュー座モールド	
C-1	Top cover 上　蓋	

Top Base plate
上 地 板

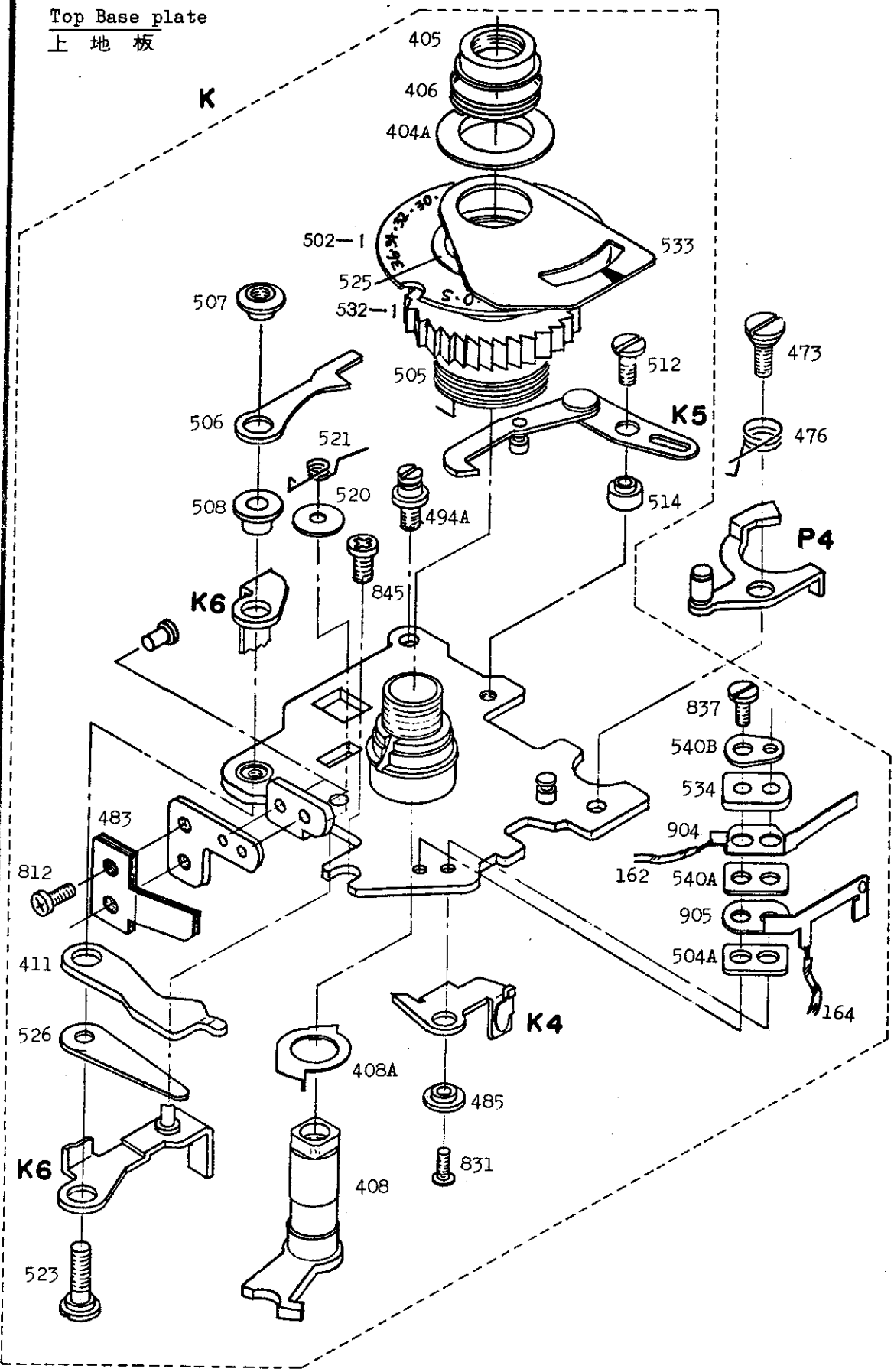


Fig. 2

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
162	Lead wire,MD switch 0.65×190 (blue) MDスイッチリード線(青)		512	Advance claw lever axle 送り爪レバー軸	
164	" ,rear curtain signal 0.65×195 (violet) 後幕シグナルリード線B		514	Collar 送り爪レバー軸カラー	
			520	Washer (1.5×5.2×0.2) 零戻しバネワッシャー	
404A	Counter retaining ring 枚数計押え板		521	Spring (d=0.26) 零戻しバネ	
405	Wind-up lever sxle nut レバー軸ナット		523	Counter reverse lever axle 零戻しレバー軸	
406	Spring (d=0.35) レバー戻しバネ	32FB -#406-2	525	Wacher (11×13×0.2) 枚数計ワッシャー	
408	Wind-up lever axle 巻上軸		526	Click lever damper クリックレバーあおり止め	
408A	Sprocket release plate スプロ制限解板		532—1	Ratchet ラチエット	
411	Click lever クリックレバー		533	Frame counter index 指標板	
473	MD switch stopper axle スイッチ制限軸		534	MD switch cover plate スイッチ押え板	
476	Spring スイッチ制限バネ		540A	Insulating plate MDスイッチ絶縁板	
483	Click lever speing クリックレバーバネ		540B	MD switch base plate MDスイッチ座板	
485	Switch lever collar スイッチレバーカラー				
494A	Apring stud 多重戻しバネ掛け		812	JCIS ⊕ PM 1.7×2.2 Type (1)	32FB-#878
			831	JCIS ⊕ CM 1.4×4 Type (1)	
502—1	Frame counter dial 枚数計		837	Screw ⊖ 1.4×3 ダイヤルプーリー取付ビス	
505	Spring (d=0.6) カウンターバネ		845	JCIS ⊕ PM 2 × 3 Type (1)	32FB-#845
506	Ratch claw 止 爪				
507	Claw nut 止爪ナット		904	MD switch contact A MDスイッチ接片A	
508	Claw collar 止爪カラー		905	MD switch contact B MDスイッチ接片B	

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
			P4	MD switch stopper スイッチ制限	
			K6	Counter reverse lever 零戻しレバー	
			K5	Advance claw 送り爪レバー	
			K4	MD switch lever スイッチレバー	
			K	Upper bracket 上地板	

Bottom base plate
下 地 板

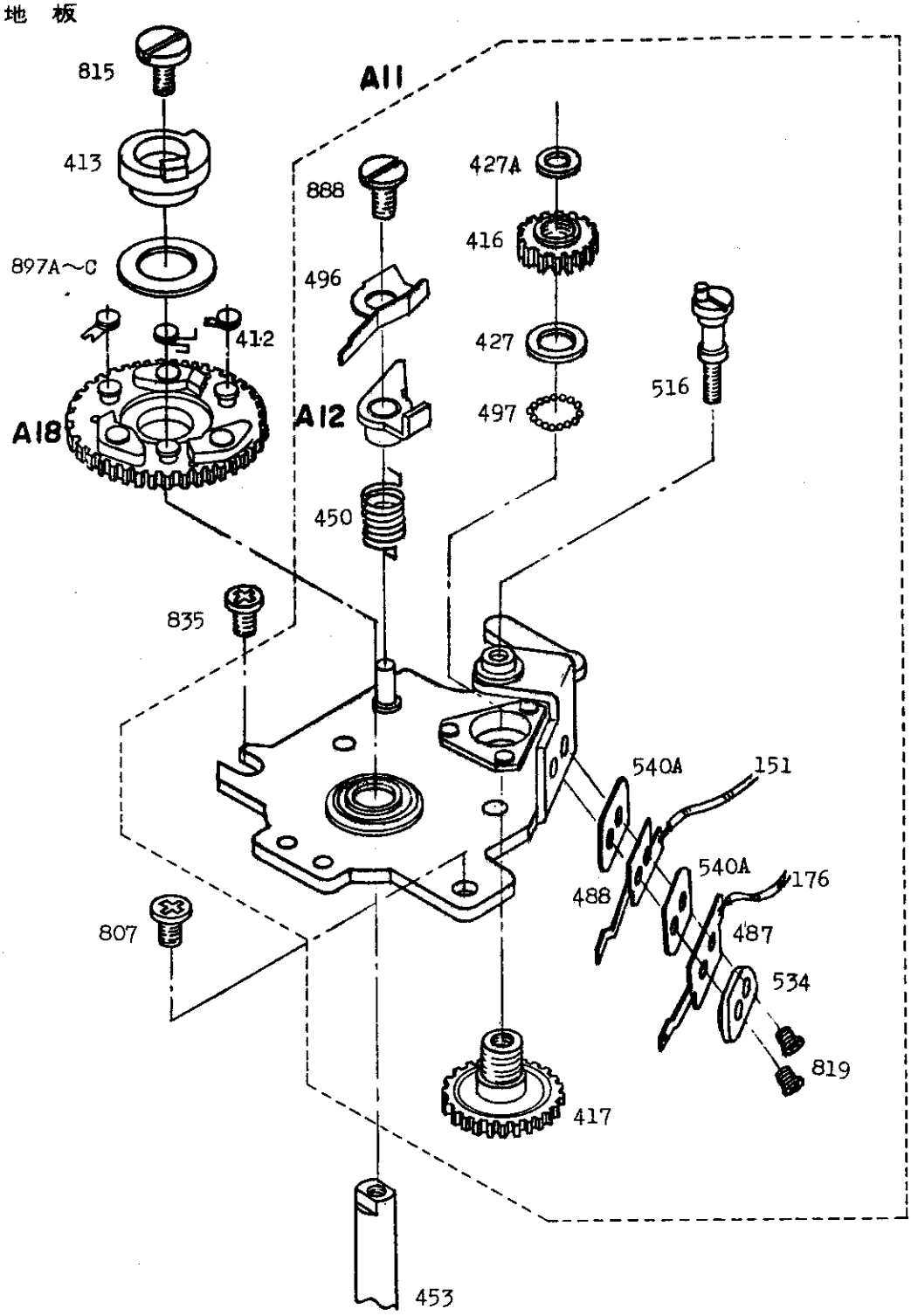


Fig. 3

Part No. 部品番号	№ Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
151	Lead wire, lever SW 0.65×200 (赤) (red) レバースイッチリード線		807	Screw ⊕ 2×3 下地板取付ビス	32FB-#807
176	" , lever switch (Or) 0.65×200 (オレンジ) レバースイッチリード線A		815	Screw (left handed) ⊖ 2×3 巻上軸ビス (左)	32FB-#815
412	Claw spring 羽根爪押えばね		819	JCIS ⊕ PM 1.4×3 Type (3)	32FB-#819
413	Advance cam 巻上げカム		835	Screw ⊕ 2×3 下地板取付ビスB	
416	Idle gear A アイドルギヤA		888	Sprocket stopper screw スプロストッパービス	
417	Idle gear B アイドルギヤB		897 A-C	Washer 巻上ギアワッシャー	
427	Washer (3.5×5.8×0.5) アイドルギアAワッシャ				
427A	Washer (2.1×4×0.2) 偏心軸ワッシャ				
450	Spring (d=0.3) スプロストッパ戻しバネ				
453	Spool shaft スプール軸				
487	Lever switch contact A 主スイッチ切片A				
488	Lever switch contact B 主スイッチ切片B				
496	Sprocket stopper spring スプロ制限板バネ				
497	Steel ball 鋼 球	32FB-#493			
516	Counter eccenter axle カウンター送り偏心軸				
534	MD switch cover plate スイッチ押え板				
540A	Insulating plate MDスイッチ絶縁板		A18	Wind-up gear 巻上レバー	
			A12	Sprocket stopper スプロストッパー	
			A11	Lower bracket 下 地 板	

Take-up shaft, Sproket shaft
巻上軸、スプロ軸

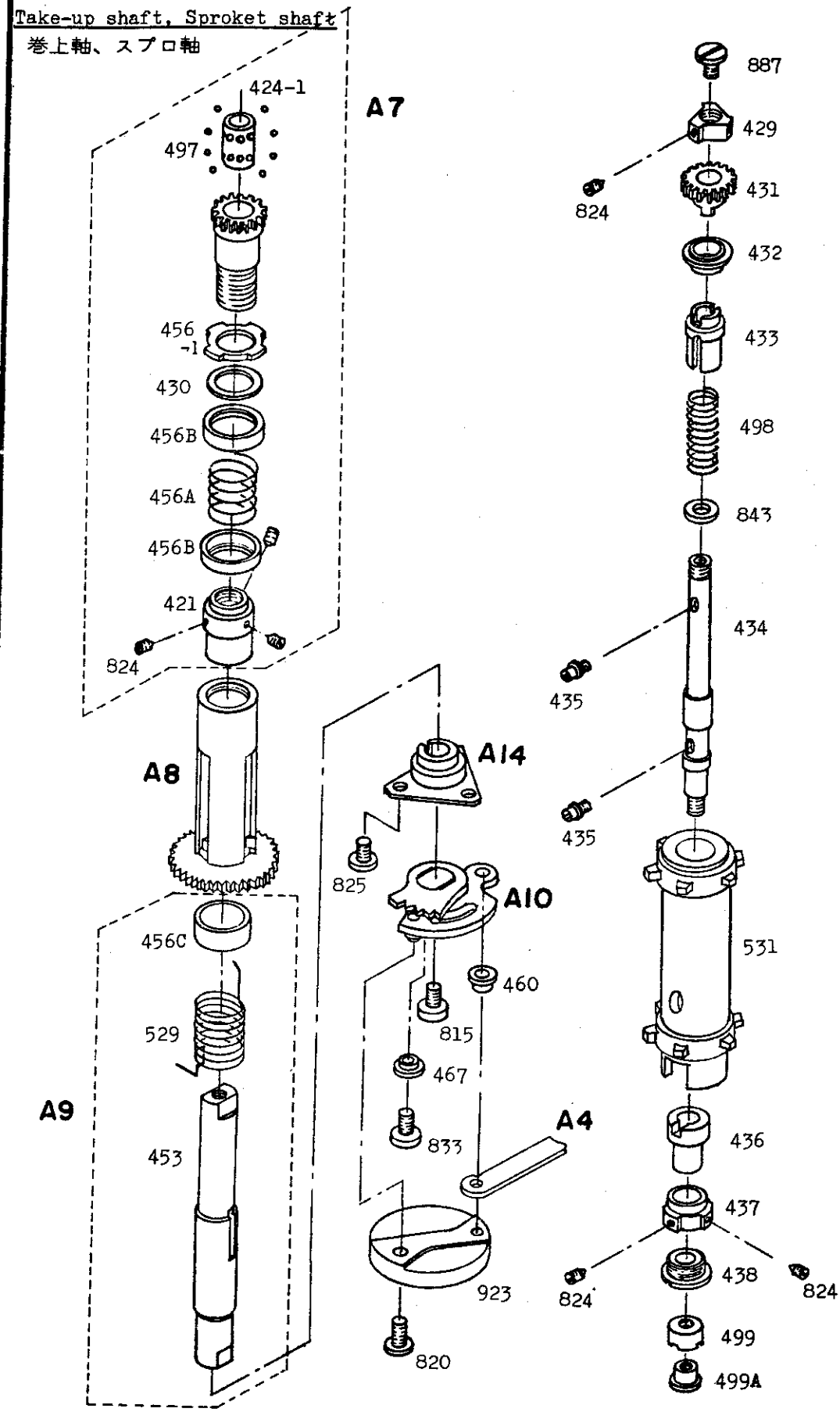


Fig. 4

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
421	Spool top gear nut スプール上ギアナット	32FB1 -#429A	498	Sprocket spring スプロケットバネ	32FB-#444
424-1	Spool gear inner tube スプールギア内筒		499	Sprocket shaft collar-B スプロケット軸カラーB	" -#449-2
429	Sprocket stopper cam スプロケット制限カム		499A	" -C スプロケット軸カラーC	" -#449C
430	Washer (7×9.8×0.3) スプール上ギアワッシャー		529	Spring スプール軸バネ	
431	Sprocket upper gear スプロ上ギア		531	Sprocket スプロケット	
432	Sprocket shaft bearing スプロケット軸受				
433	Sprocket collar スプロケットカラー		815	Screw (left handed) ⊖ 2×3 巻上軸ビス (左)	32FB-#815
434	Sprocket shaft スプロケット軸		820	Coupling screw カップリングビス	" -#932
435	Sprocket screw スプロケットビス	32FB -#834-1	824	Gear set screw ギャセットビス	" -#824
436	Sprocket collar A スプロケットカラー A		825	JCIS ⊕ PM 2×2.5 Type (1)	
437	Sprocket collar A nut スプロカラーAナット		833	Screw (left handed) ⊖ 1.7×3 ゆるみ止めビス	
438	Sprocket shaft bearing スプロ軸受		843	Washer (3.2×5.5×0.2) スプロケットバネ受座金	32FB-#843
453	Spool shaft スプール軸		887	Screw (left handed) ⊖ 1.7 × 2 スプロケット左ネジ	
456-1	Friction plate フリクション板	32FB-#434	923	MD coupling モーターカップリング	
456A	Friction spring フリクションバネ	" -#433	A14	Spool shaft bearing スプール軸受けケース	
456B	Spring tray バネ受け皿	32FB1 -#433A	A10	Set cam セットカム	
456C	Spring holder バネ押え筒	" -#499	A9	Spool shaft スプール軸	
460	Collar セットカムカラー	32FB -#491-1	A8	Spool スプール	
467	Collar ゆるみ止めカラー		A7	Spool top gear スプール上ギア	
497	Steel ball 鋼球	32FB-#493	A4	Shutter charge lever シャッターチャージレバー	

Functional control
管 制 部

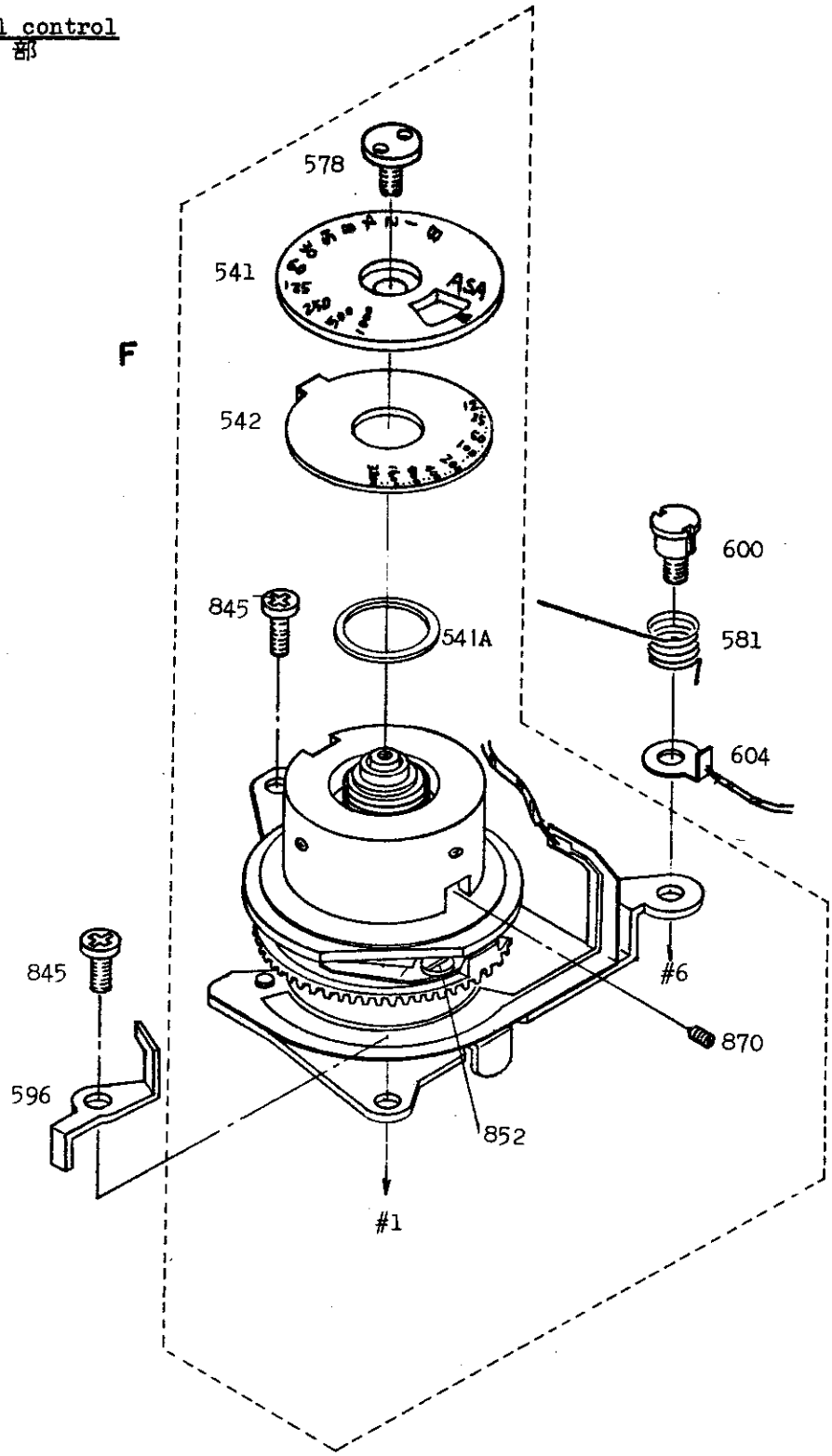


Fig. 5

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
541	T-dial シャッター目盛盤				
542	ASA dial ASA目盛板				
578	Dial top screw ダイアル上面ビス				
581	Spring アースバネ(d=0.3)				
596	FRE stopper FRE制限板				
600	Control unit base screw 基板取付ビスB				
604	Lug ラグ板				
845	JCIS ⊕ PM 2×3 Type (1)	32FB-#845			
852	Screw ⊖ 1.4×2 ブラシ取付ビス	" -#852-1			
854	Washer (2.1×5×0.6) ミラーアップ押え レバー座金				
870	SC 1.4 × 2.5				
541A	Adjusting washer 調整ワッシャー				
			F	Functional control 管制部	

Rewind shaft
巻 戻 軸

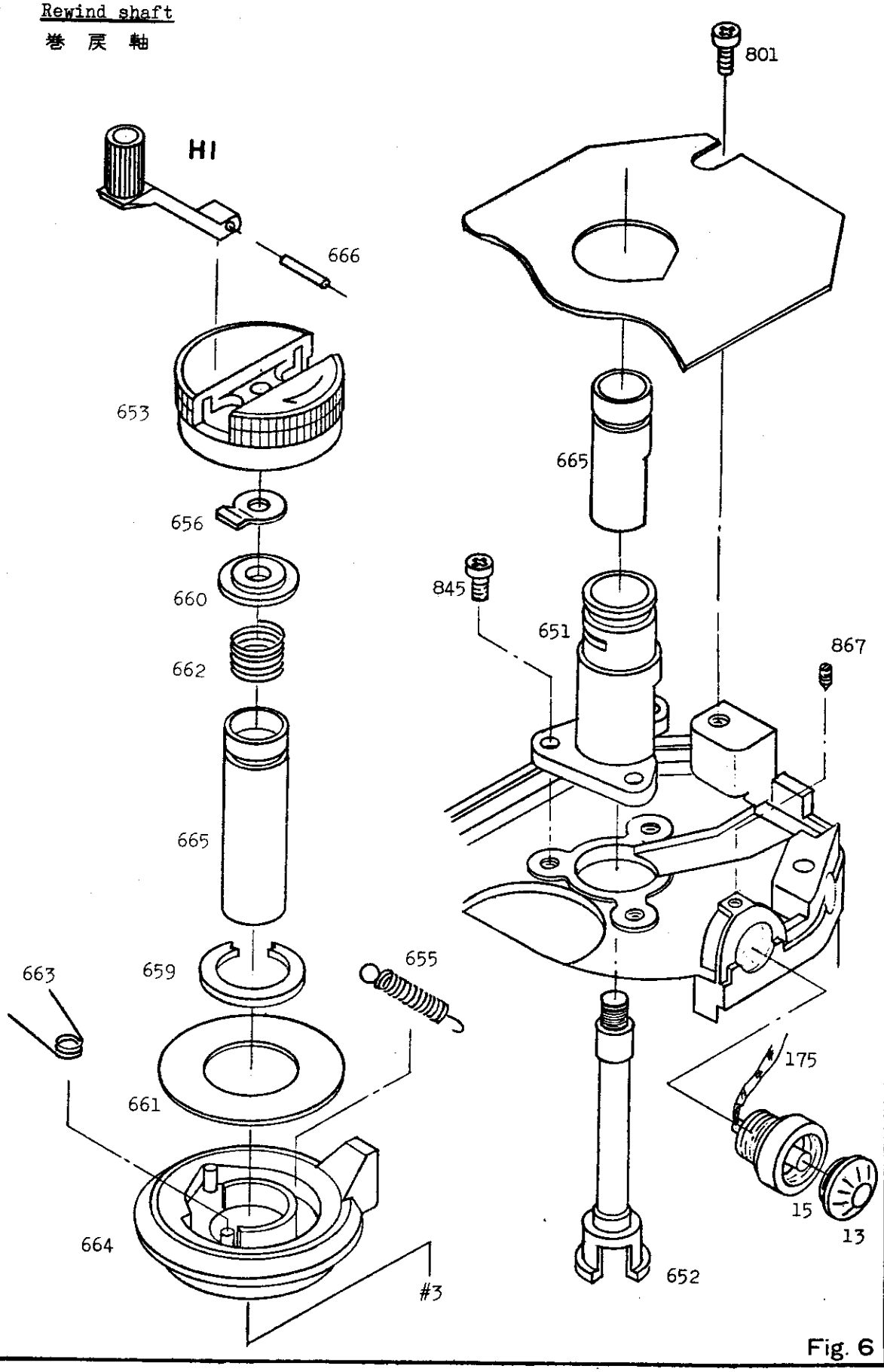
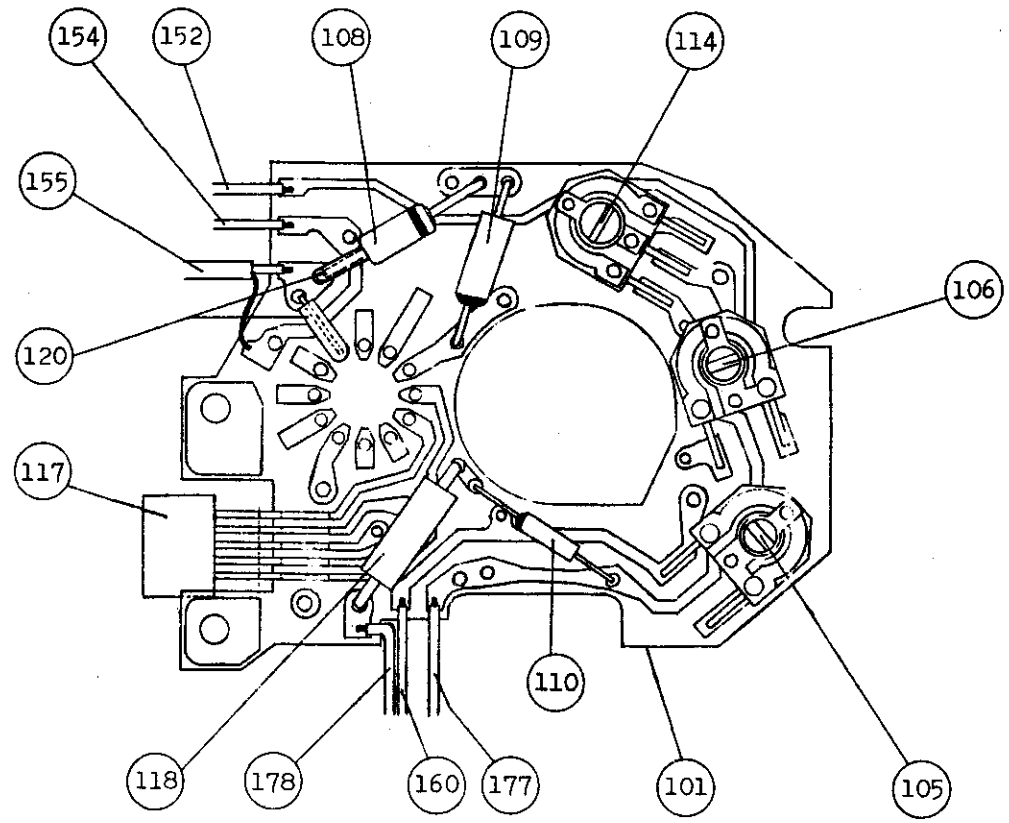


Fig. 6

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
13	Sync socket cap ターミナルキャップ	32FB-#15A	801	JOIS ⊕ PM 2×3 Type (3)	
15	Sync socket シンクロソケット	S-8504	845	JCIS ⊕ PM 2×3 Type (1)	32FB-#845
			867	SC 1.7×2	
175	Lead wire, sync 0.65×100 (緑) (green) シンクロリード線B				
651	Rewind shaft bearing 巻戻軸受				
652	Rewind shaft 巻戻軸				
653	Rewind knob 巻戻ノブ				
655	Spring 開閉ノブバネ(d=0.25)				
656	Rewind lever spring レバー受バネ	32FB-#606			
659	Knob clip 開閉ノブ押えクリップ				
660	Washer 巻戻軸座金				
661	Cover ring 巻戻飾り板				
662	Friction spring フリクションバネ(d=0.4)				
663	Spring 開閉ロックバネ(d=0.5)				
664	Back cover lock knob 開閉ノブ				
665	Rewind shaft guide 巻戻軸ガイド				
666	Rewind lever shaft 巻戻レバー軸	32FB-#609			
			H1	Rewind lever 巻戻しレバー	

IC printed circuit ICプリント板

M



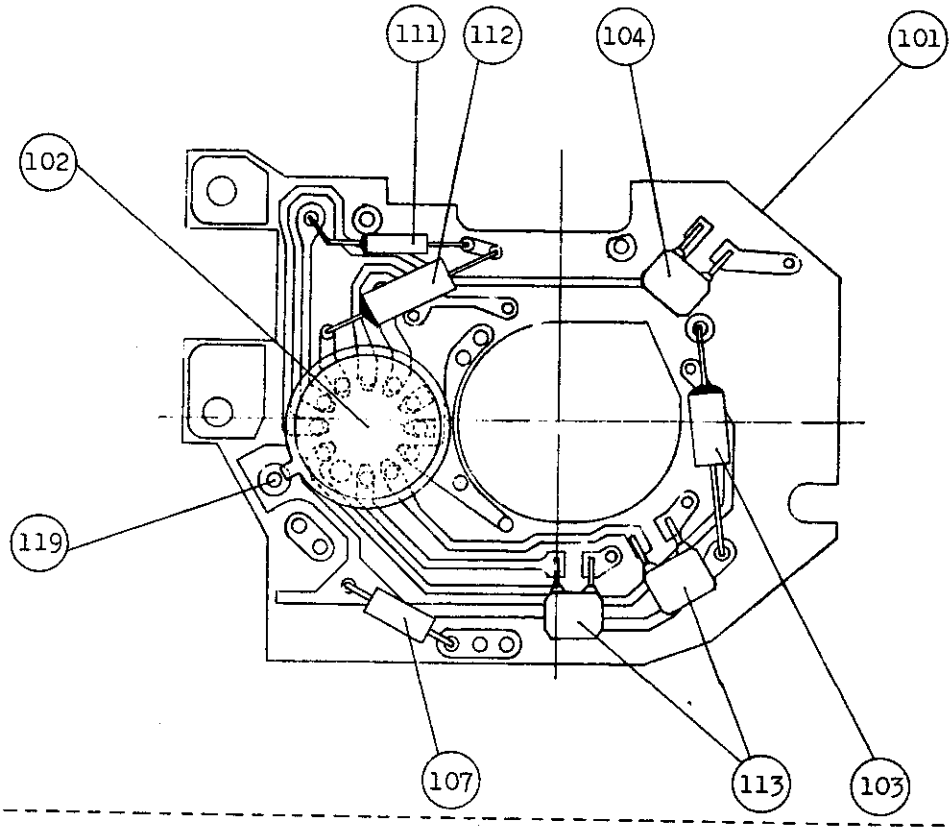


Fig. 7

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
			155	Lead wire, PD 0.65×28 (red) 測光用PDテフロン線A(赤)	
			160	" , power source 0.65×110 (黄) (yellow) 測光用電源リード線	
103	Bypass capacitor バイパスコンデンサー		177	" , grounder 0.65×85 (黒) (black) 電源マイナスリード線	
104	FRE resistor FRE用抵抗		178	" , power source 0.65×80 (赤) (red) 測光用電源リード線	
105	FRE variable resistor FRE用調整抵抗				
106	FRE variable resistor FRE用調整抵抗				
107	Latch cutoff resistor A ラッチ防止抵抗A				
108	Latch cutoff diode ラッチ防止ダイオード				
109	Latch cutoff capacitor-A ラッチ防止コンデンサーA				
110	Latch cutoff capacitor-B ラッチ防止コンデンサーB				
111	Oscillation cut-off capacitor 発振止めコンデンサー				
112	Filter capacitor フィルター用コンデンサー				
113	Offset resistor オフセット用抵抗				
114	Offset adjust resistor オフセット調整抵抗				
117	Light emitting diode L E D				
118	Latch cutoff resistor B ラッチ防止抵抗B				
119	IC grounder pin ICアースピン				
120	IC pin insulator tube ICピン絶縁チューブ				
152	Lead wire, FRE 0.65×70mm (桃) (pink) FERリード線				
154	" , FRE 0.65×90 (黒) (black) FREリード線B		M	IC printed circuit ICプリント板	

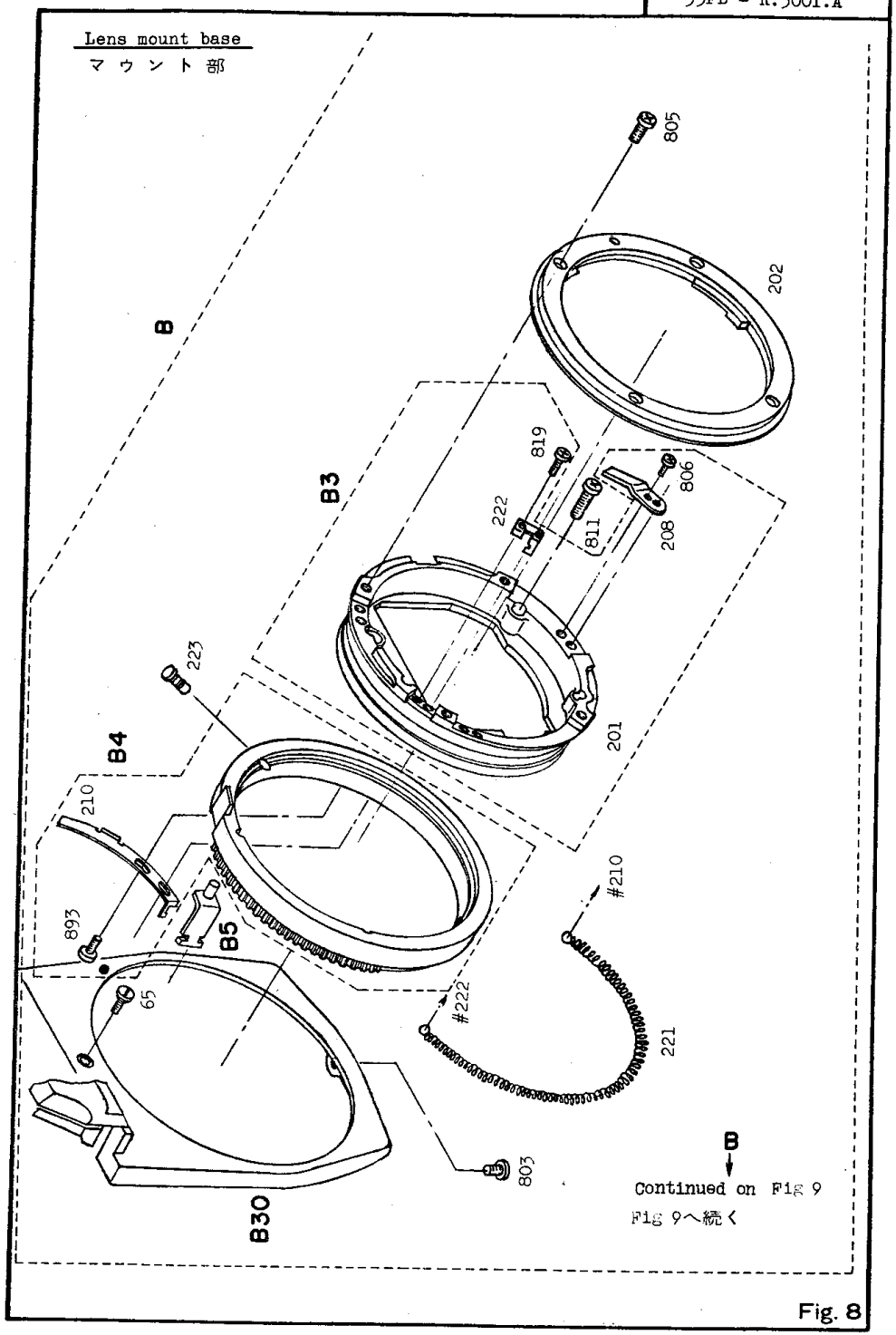

Lens mount base
マ ウ ン ト 部
B
B3
B4
B5
B30
805
202
819
806
222
811
208
223
201
210
893
65
#210
#222
221
803
B
Continued on Fig 9
Fig 9へ続く

Fig. 8

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
65	Shoulder screw 前カバー用段ビス				
201	Lens mount base マウント台				
202	Bayonet ring バヨネットリング	32FB1 -#202			
208	Bayonet spring バヨネットバネ	32FB-#208			
210	Coupling lever spring 絞り連動片バネ				
221	Spring 引張バネ				
222	Coupling ring stopper 連動環回転制限				
223	Coupling lever button 連動片バネボタン				
803	JCIS ⊕ PM 1.7×3 Type (1)	32FB-#803			
805	Screw ⊕ 2×3.6 バヨネット止めビス	32FB-#805			
806	JCIS ⊕ PM 1.7×1.8 Type (1)	" -#806			
811	Screw ⊕ 2×6.7 バヨネット台ビス	" -#811			
819	JCIS ⊕ PM 1.4×3 Type (3)	" -#819			
893	Coupling lever spring screw 絞り連動片バネビス		B30	Front cover 前カバー鈑板	
			B5	Lens release lever 着脱レバー	
			B4	Aperture coupling ring 絞り連動環	
			B3	Lens mount マウント台	
			B	Front plate 前板部	

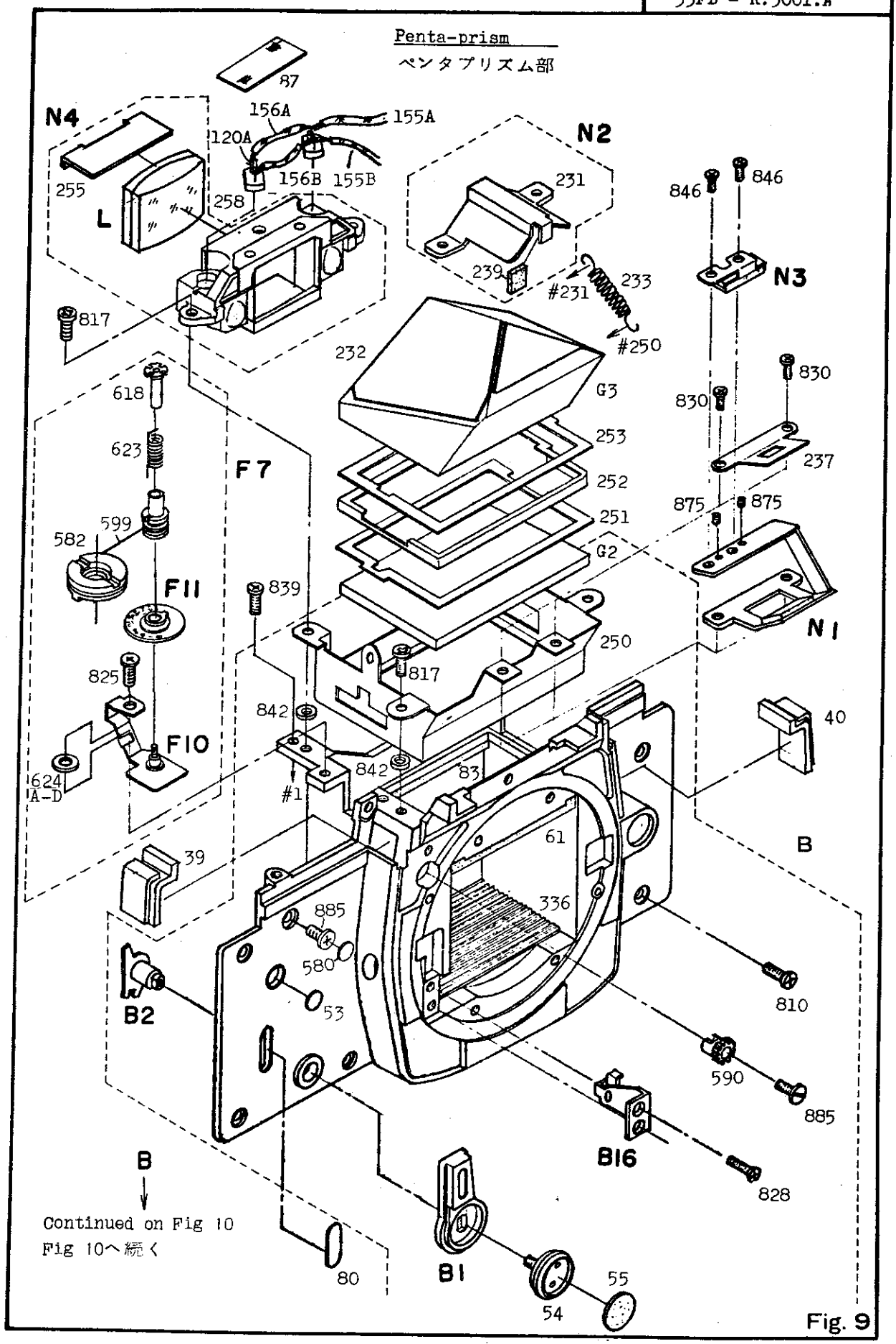

Penta-prism
ペンタプリズム部
87
N4
156A
120A
155A
156B
155B
255
L
258
N2
231
239
#231
233
#250
846
846
N3
817
232
G3
253
252
251
G2
250
618
623
F7
599
582
F11
839
825
F10
624
A-D
842
842
#1
817
830
830
237
875
875
N1
40
83
61
B
39
336
885
580
53
B2
810
590
885
B16
828
B
Continued on Fig 10
Fig 10へ続く
80
B1
55
54

Fig. 9

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
39	Shoulder cover, right 前板右肩カバー		250	Prism box プリズムボックス	
40	Shoulder cover, left 前板左肩カバー		251	Viewfield mask 視野枠	
53	Front plate hole cover 前板孔カバー		252	Spacer 間隔枠	
54	Self-timer lever screw セルフレバービス		253	Prism mask プリズム絞り板	
55	Self-timer lever leatherette セルフレバー用皮		255	Eyepiece lens retainer 接眼レンズ押え板	32FB-#255
61	Mirror-up cushion sponge ミラーアップ受モルト	32FB-#345	258	Photo diode フォトダイオード	
80	Frcnt plate hole cover 前板穴カバー				
83	Mirror box rear light-tight ミラーボックス後部モルト		336	Bottom light baffle 底遮光板	
87	Retaining tape コード押えテープ				
120A	IC pin insulator tube ICピン絶縁チューブ		580	Hole cover ギア調整用孔カバー	
155A	Lead wire, PD 0.66×28 (白)(white) 測光用PDテフロン線		582	T-dial pulley Tダイアルプーリー	
155	" , PD 0.66x28 (red) 測光用PTテフロン線A(赤)		590	Front pinion 前小ギヤ前小ギヤ	
156	" , PD 0.66×32 (赤)(red) 測光用PDテフロン線C		599	T-film string Tフイルム系	
156A	" , PD 0.66×32 (白)(white) 測光用PTテフロン線D				
			618	T-film nut Tフィルムナット	
231	Penta-prism retainer ペンタ押え板		623	Spring Tフィルムバネ(d=0.2)	
232	Prism retainer sheet プリズム押えシート		624 A-D	Washer Tフィルム基板座金	
233	Prism retaining spring プリズム押えバネ	32FB-#264			
237	F-mask plate 枠 板		810	Screw ⊕ 2×3.5 前板取付ビス	32FB-#810
239	Prism retaining sponge ペンタ押えモルト		817	JCIS ⊕ PM 2×5 Type(3)	

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
825	JCIS ⊕ PM 2×2.5 Type (1)				
828	JCIS ⊕ CM 2×3.5 Type (1)	32FB-#828			
830	JCIS ⊕ PM 1.4×2 Type (3)				
839	JCIS ⊕ PM 1.7×4 Type (3)	32FB-#839			
842 a-u	Washer 調整座金	32FB -#842a-u			
846	JCIS + PM 1.4×1.5 Type (3)				
875	SR 1.4 × 2.5				
885	Screw ⊖ 1.4 × 2 アイドルギア取付ビス				
			L	Eyepiece lens 接眼レンズ	
G2	Fresnel-lens フレネル		N4	Eyepiece mold 接眼モールドメガネ	
G3	Penta-prism ペンタプリズム		N3	F-mirror adjustor ミラー調整板	
			N2	Penta prism retainer ペンタ押え	
			N1	F-mirror holder ミラー保持板	
			F11	T-film boss フィルムボス	
			F10	T-film base plate フィルム基板	
			F7	T-dial pulley Tダイアルプーリー	
			B16	45 stopper 45 ストッパー	
			B2	Self-timer coupling lever セルフ連動レバー	
			B1	Self-timer lever セルフ作動レバー	
			B	Front plate 前板部	

Front plate (wind-up side)

前板部（巻上側）

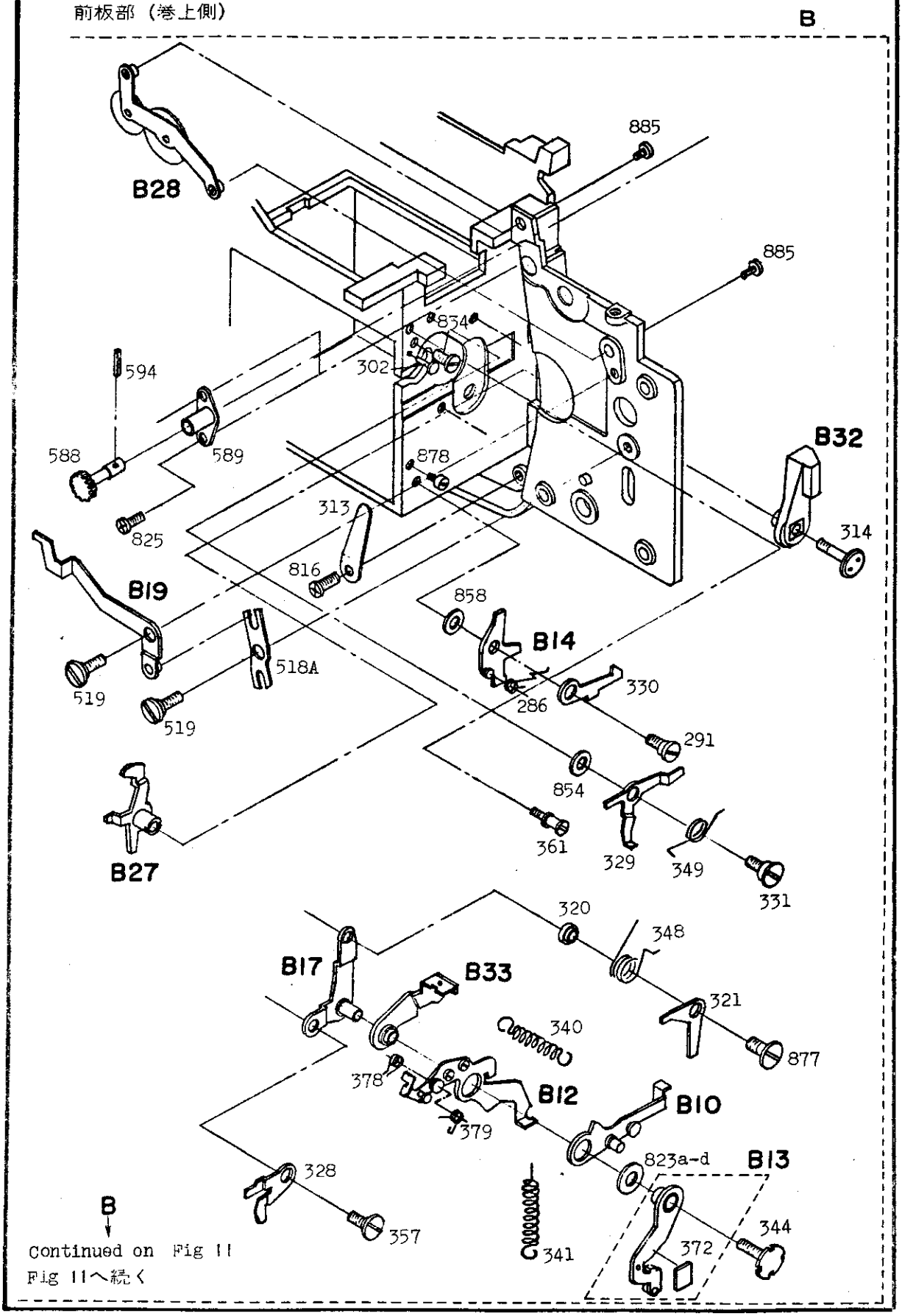


Fig. 10

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
291	Latch lever axle 係止レバー軸		379	Mirror spring (small) ミラースプリング (小)	
286	Brake sprimg 後ブレーキばね		518A	Release lever fork レリーズレバー二又	
302	Mirror shaft 巻上側チリトリ回転軸		519	Relèase lever axle, レリーズレバー軸	
313	Stop-down lever spring 手動絞りレバーバネ		588	Gear 軸付ギヤ	
314	Stop-down lever screw 絞りレバービス		589	Gear bearing ギヤ軸受	
320	Collar シャッターレリーズ レバーカラー		594	Spring pin スプリングピン	
321	Shutter release lever シャッターレリーズレバー		816	JCIS ⊕ PM 2×2 Type (3)	
328	Signal lever シグナルレバー		823 a-d	Washer ミラーレバー軸調整座金	
329	Mirror-up stop lever ミラーアップ押えレバー		825	JCIS ⊕ PM 2×2.5 Type (1)	
330	Mirror-down latch lever ミラーダウン係止レバー		834	Screw ⊖1.7×2 チリトリピン押えビス	
331	Mirror-up stop lever axle ミラーアップ押えレバー軸		854	Wacher (2.1×5×0.6) ミラーアップ押え レバー座金	
340	Spring 絞りレバーバネ(d=0.32)		858	Washer (5×2.2×0.2) ミラーボックス座板	32FB-#858
341	Spring (d=0.29) ミラーアップバネ		877	Release lever axle シャッターレリーズ レバー軸	
344	Mirror-down lever screw レバー押えビス		878	Down lever stopper ダウン係止レバーストップ	
348	Spring (d=0.26) シャッターレリーズバネ		885	Screw ⊖ 1.4×2 アイドルギヤ取付ビス	
349	Spring (d=0.26) ミラーアップ押えバネ				
357	Signal lever screw シグナルレバー止メビス				
361	Spring stud ミラーアップ押え レバーバネ掛け				
372	Cushion rubber 防振用ゴム				
378	Mirror spring (large) ミラースプリング (大)				

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
			K5	Advance claw 送り爪レバー	
			B33	Spring holder 絞りレバーバネ掛け	
			B32	Stop-down lever 絞り込みレバー	
			B28	Idle gear base plate アイドルギア基板	
			B27	Stop-down coupling lever 手動絞りレバー	
			B19	Release lever レリーズレバー	
			B17	Mirror lever base plate ミラーレバー軸取付板	
			B14	Mirror-down signal lever ミラーダウン信号レバー	
			B13	Mirror-down lever ミラーダウンレバー	
			B12	Mirror-up lever ミラーアップレバー	
			B10	Stop-down coupling lever 絞りレバー	
			B	Front plate 前板部	

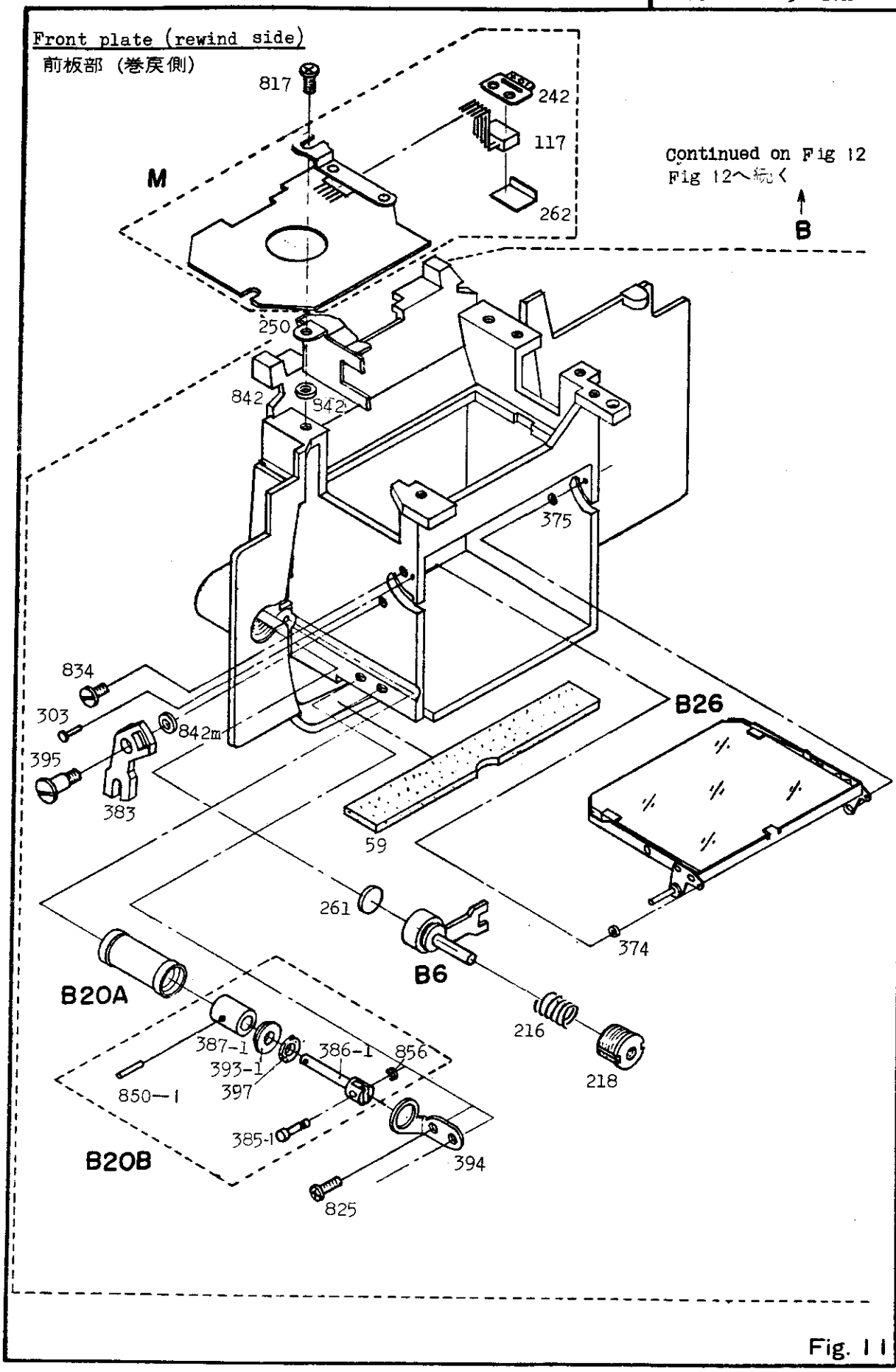

Front plate (rewind side)
前板部 (巻戻側)
817
242
117
262
M
Continued on Fig 12
Fig 12へ続く
B
250
842
842
375
834
303
842m
395
383
59
B26
261
374
B6
B20A
216
218
387-1
393-1
386-1
856
850—1
397
385-1
394
B20B
825

Fig. 11

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
59	Mirror box bottom sponge ミラーボックス下部モルト		817	JCIS ⊕ PM 2×5 Type (3)	
			825	/JCIS ⊕ PM 2×2.5 Type (1)	
117	Light emitting diode L E D		834	Screw ⊖ 1.7×2 チリトリピン押えビス	
216	Lens release button spring 着脱ボタンバネ	32FB-#216	842 a-u	Washer 調整座金	32FB -#842a-u
218	Lens release button sleeve 着脱ボタン軸受	32FB-#218	842m	Wacher (2.1×3.8×0.5) 調整座金	" -#842m
242	Exposure mark film 記号表示フイルム		850-1	Air damper piston pin エアダンパーピストンピン	
250	Prism box プリズムボックス		856	Snap ring E - 10	
261	Lens release button pad レンズ着脱ボタン飾り	32FB-#269			
262	LED light-baffle plate LED遮光板				
303	Mirror shaft 巻上側チリトリ回転軸				
374	Collar ミラー巻戻側カラー				
375	Washer ミラー巻上側ワッシャー				
383	Air damper lever エアダンパー駆動レバー				
387-1	Air damper piston エアダンパーピストン				
393-1	Sylinder cover (B) エアダンパー シリンダー蓋 (B)		M	IC printed circuit ICプリント板	
394	Air damper holder エアダンパーホルダー		B26	Mirror holder ミラーチリ取り	
395	Damper lever screw エアダンパー 駆動レバー止ビス		B20B	Air damper piston エアダンパーピストン	
397	Damper packing rubber エアダンパーゴム		B20A	Air damper cylinder エアダンパーシリンダ	
386-1	Damper connecting pin エアダンパー連接ピン		B6	Lens release button 着脱ボタン	
385-1	Damper pin エアダンパー駆動受けピン		B	Front plate 前板部	

Front plate (bottom side)
前板底部

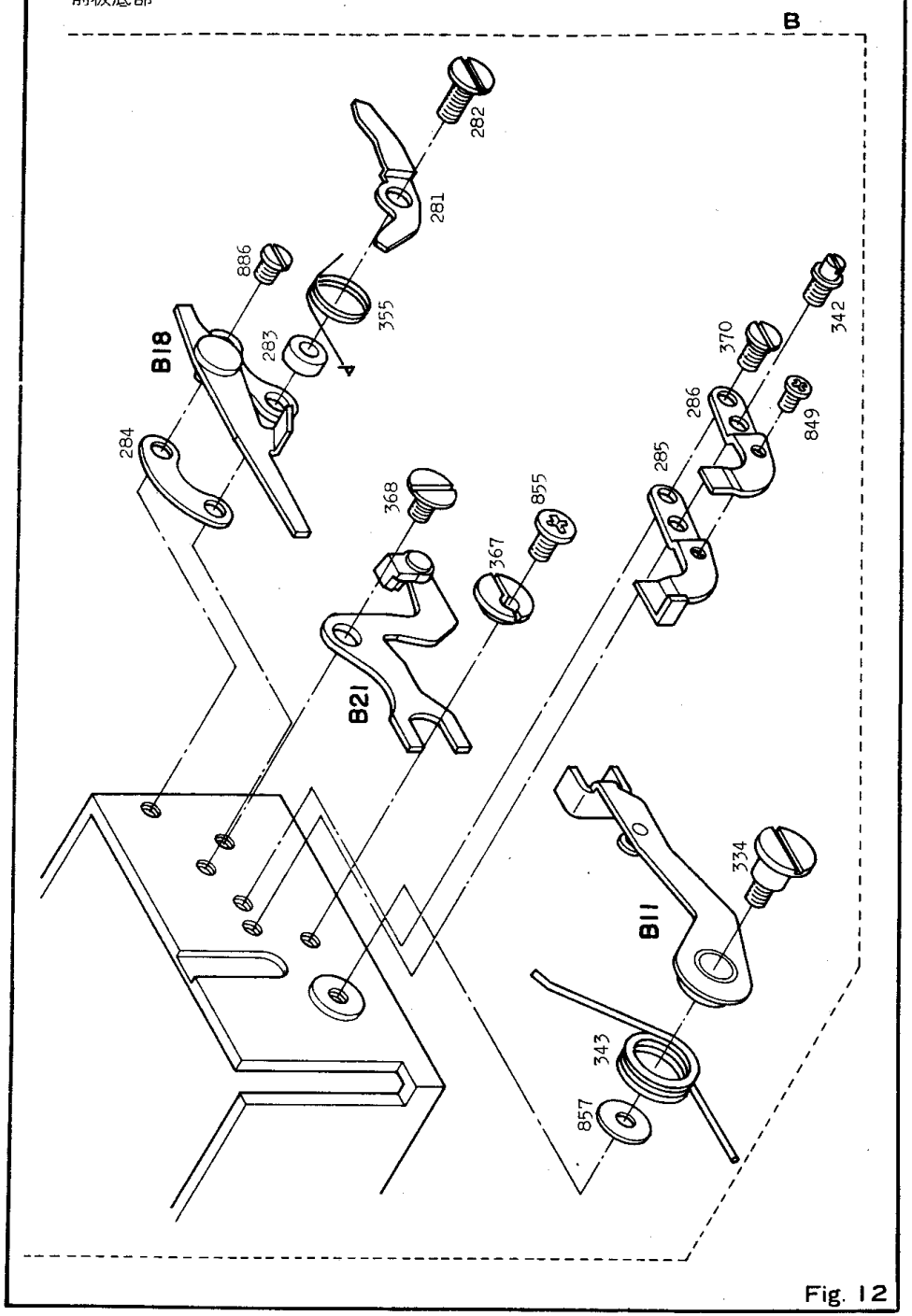


Fig. 12

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
281	Brake release lever ブレーキ解除レバー				
282	Brake release shaft ブレーキ解除軸				
283	Collar ブレーキ解除軸カラー				
284	Brake middle-lever base 中間レバー座金				
285	Brake spring base 後ブレーキバネ基板				
286	Brake spring 後ブレーキバネ				
334	Mirror charge lever axle 大レバー軸				
342	Middle lever stopper 中間レバー制限				
343	Spring ダウンバネ(d=0.8)				
355	Spring (d=0.26) ブレーキレバー戻しバネ				
367	Down lever eccenter 調整レバー偏心軸				
368	Down lever adjuster axle ダウンレバー調整レバー軸				
370	Brake spring screw 後ブレーキバネ止めビス				
849	Screw ⊕ 1.4×2.5 Tダイヤル基板ビス	32FB-#849			
855	JCIS ⊕PM 2×3.5 Type (3)	32FB-#855	B21	Down lever adjustor ダウンレバー調整レバー	
857	Washer (5.5×2.1×0.5) 大レバー座金		B11	Mirror charge lever 大レバー	
886	Screw ⊖ 2 × 2.5 中間基板止めビス		B18	Middle lever base plate 中間レバー基板	
			B	Front plate 前板部	

Body
ボディ

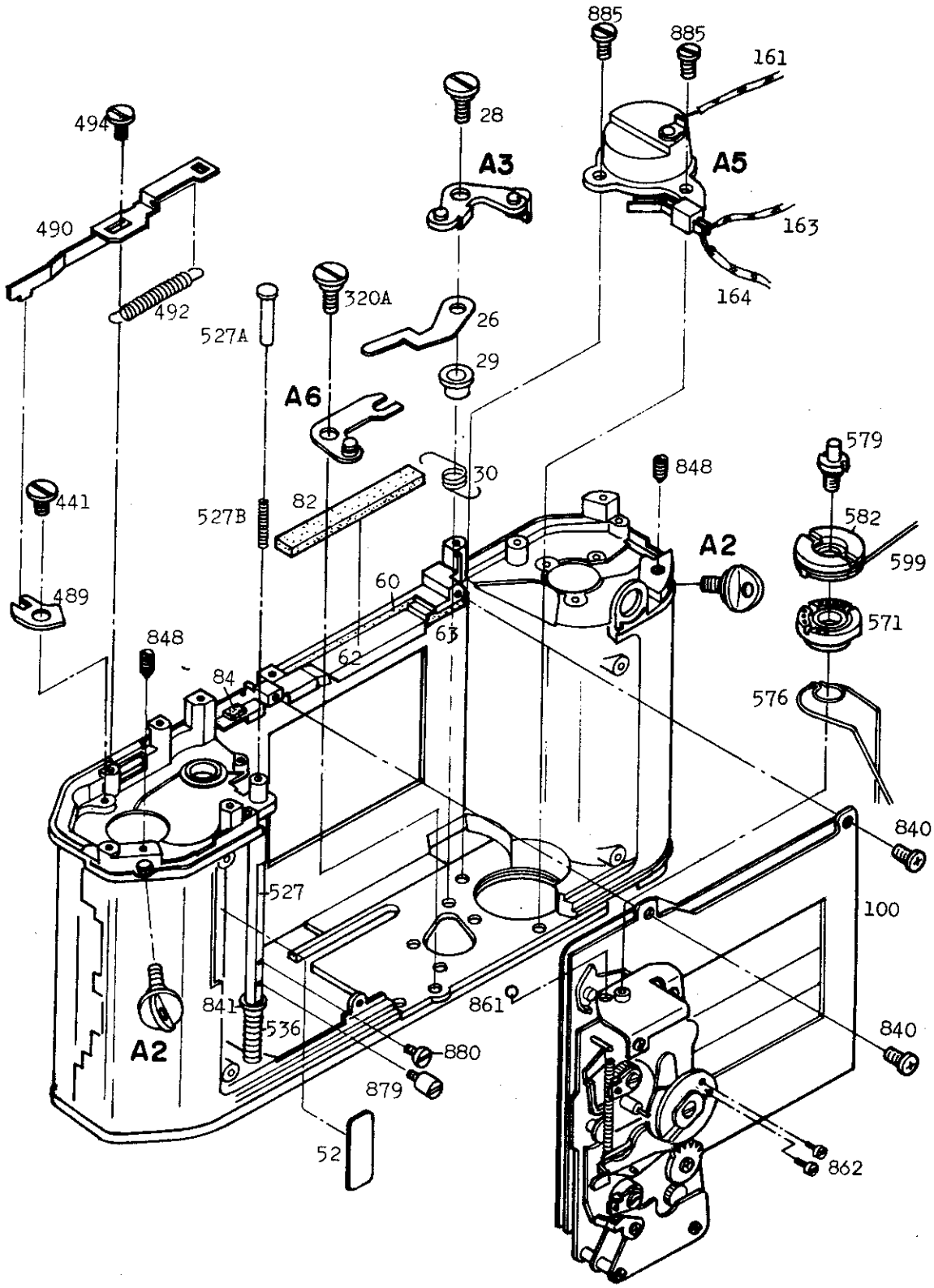


Fig. 13

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
26	Blank shot check lever 空撮り防止レバー		490	Multi-exposure arm A 多重取りアームA	
28	MD signal lever axle MD信号レバー軸		491	Multi-exposure knob 多重取りツマミ	
29	Collar 空撮り防止レバー軸カラー		492	Spring (d=0.3) 多重取りアーム戻しバネ	
30	Spring (d=0.26) MD信号レバーバネ		494	Guide pin ガイドピン	
52	Lead wire cover コード溝カバー				
60	Etepiece bottom light-tight 接眼下部遮光モルト		527	Release shaft レリーズ軸	
62	Shutter top cover シャッター上カバー板		527A	Release middle shaft レリーズ軸補助	
63	Shutter cushion rubber シャッター羽根受けゴム		527B	Spring (d=0.12) レリーズ釦補助バネ	
82	Shutter light-tightener シャッター遮光モルト		536	Spring レリーズ軸バネ	32FB-#475
84	Light tight sponge 遮光押えモルト		571	Click pulley クリックプーリー	
			576	T-dial string シャッター変速系	
100	Shutter シャッター		579	Shoulder screw プーリー段ビス	
161	Lead wire, power source 0.65×40 (赤) (red) MD測光用電源リード線B		582	T-dial pulley Tダイアルプーリー	
163	" , rear curtain signal 0.65×45 (緑) (green) 後幕シグナルリード線A		599	T-film string Tフィルム系	
164	", " 0.65x195(violet) (紫) 後幕シグナルリード線B		840	JCIS ⊕ PM 2×3 Type (3)	
			841	Snap ring E — 24	31F3B -#836
320A	Charge lever axle チャージレバー軸	32FB1-#317	848	Eyelet set screw つり環ビス	32FB-#848
			861	Click ball シャッタークリックボール	
441	Charge cam claw release lever axle 三羽根爪外しレバー軸		879	Release lever guide pin レリーズレバーガイド軸	
489	Charge cam claw release lever 三羽根爪外しレバー		880	B-lever release screw Bレバー解除ビス	

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
885	Screw ⊖ 1.4x2 アイドルギヤ取付ビス				
862	Screw ⊖ 1.4×1.1 糸押えビス				
			A6	Charge lever チャージレバー	
			A5	Battery chamber 電池ケース	
			A3	MD switch coupling lever MDスイッチ連動レバー	
			A2	Eyelet つり環	

Body bottom

ボディ底部

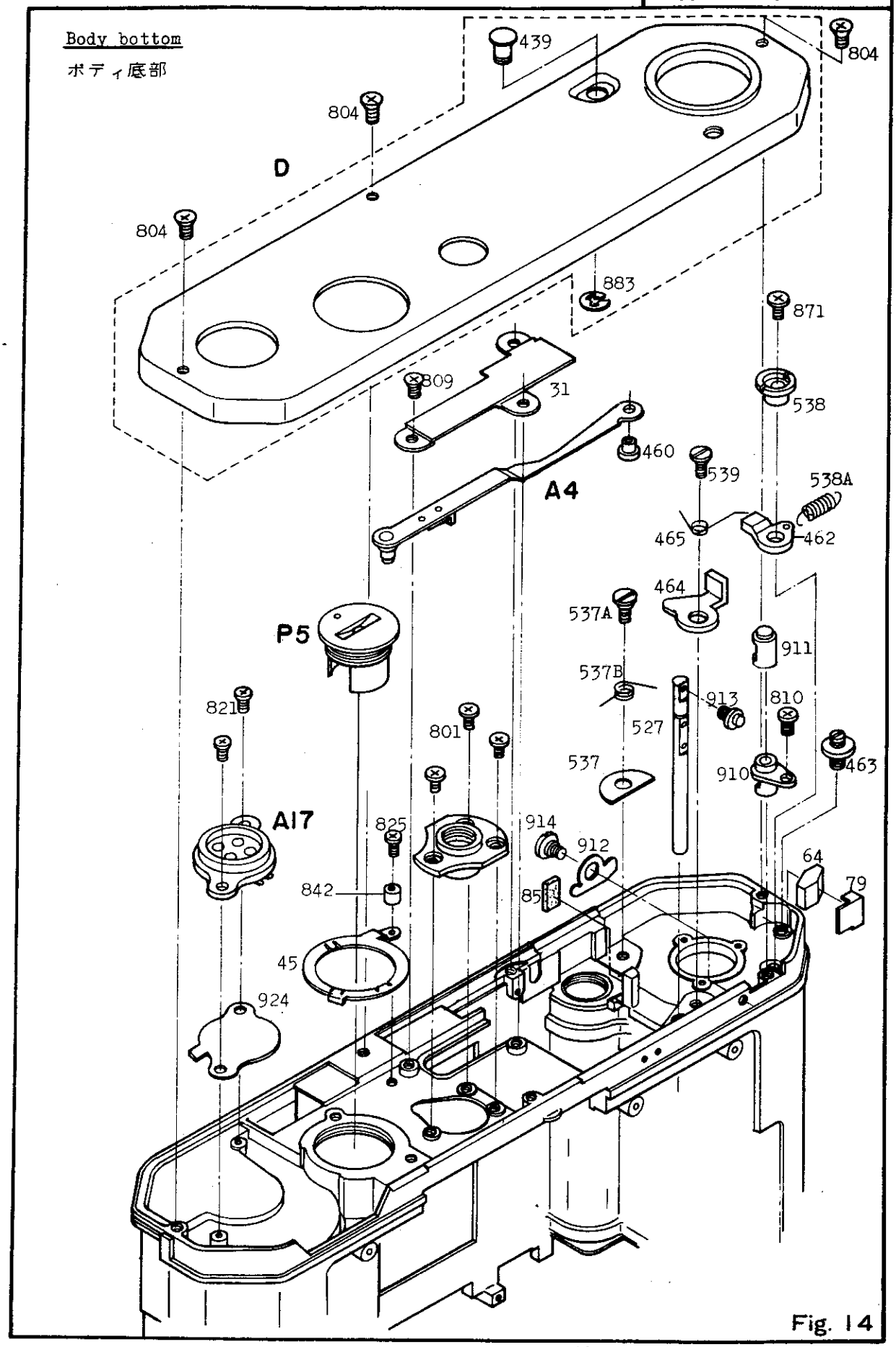


Fig. 14

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
10	Tripod socket 三脚座		801	JCIS ⊕ PM 2×3 Type (3)	
31	Bottom retaining plate 底部押え板		804	JCIS ⊕ CM 1.7×2.5 Type (1)	32FB-#804
			809	JCIS ⊕ CM 2×3 Type (1)	
64	Shock absorb rubber A 緩衝ゴムA		810	Screw ⊕ 2×3.5 前板取付ビス	32FB-#810
79	Baffle plate 緩衝板		821	JCIS ⊕PM 2×4 Type (3)	
85	Charge lever rubber シャッターチャージ レバーゴム		825	JCIS ⊕ PM 2×2.5 Type (1)	
439	Rewind button 巻戻し釦		842 a-u	Wacher 調整座金	32FB -#842a-u
460	Collar セットカムカラー	32FB -#491-1	871	JCIS ⊕ CM 2 × 4.5 Type (3)	
462	Pendulum 振り子		883	Snap ring E - 17	32FB-#883
463	Spring stud 振り子バネ軸		910	MD coupling shaft bearing MD軸受	
464	Lock lever ロックレバー		911	MD coupling shaft MD軸	
465	Spring (d=0.26) ロックレバーバネ		912	MD seesaw lever MDシーソーレバー	
527	Release shaft レリーズ軸		913	Release coupling screw レリーズ連結ネジ	
537	AR lever ARレバー	32FB -#497-1	914	MD seesaw lever axle MDシーソー レバー軸	
537A	AR lever axle ARレバー軸	32FB-#480	924	Insulator 絶縁シート	
537B	Spring ARレバーバネ	32FB-#481			
538	Pendulum axle 振り子軸	" -#483	P5	Battery chamber cap 電池キャップ	
538A	Pendulum spring 振り子ばね	" -#484	D	Bottom cover 底蓋	
539	Lock lever axle ロックレバー軸	" -#487	A17	MD remote socket MD 外部接点	
			A4	Shutter charge lever シャッターチャージレバー	

Back cover
裏 蓋

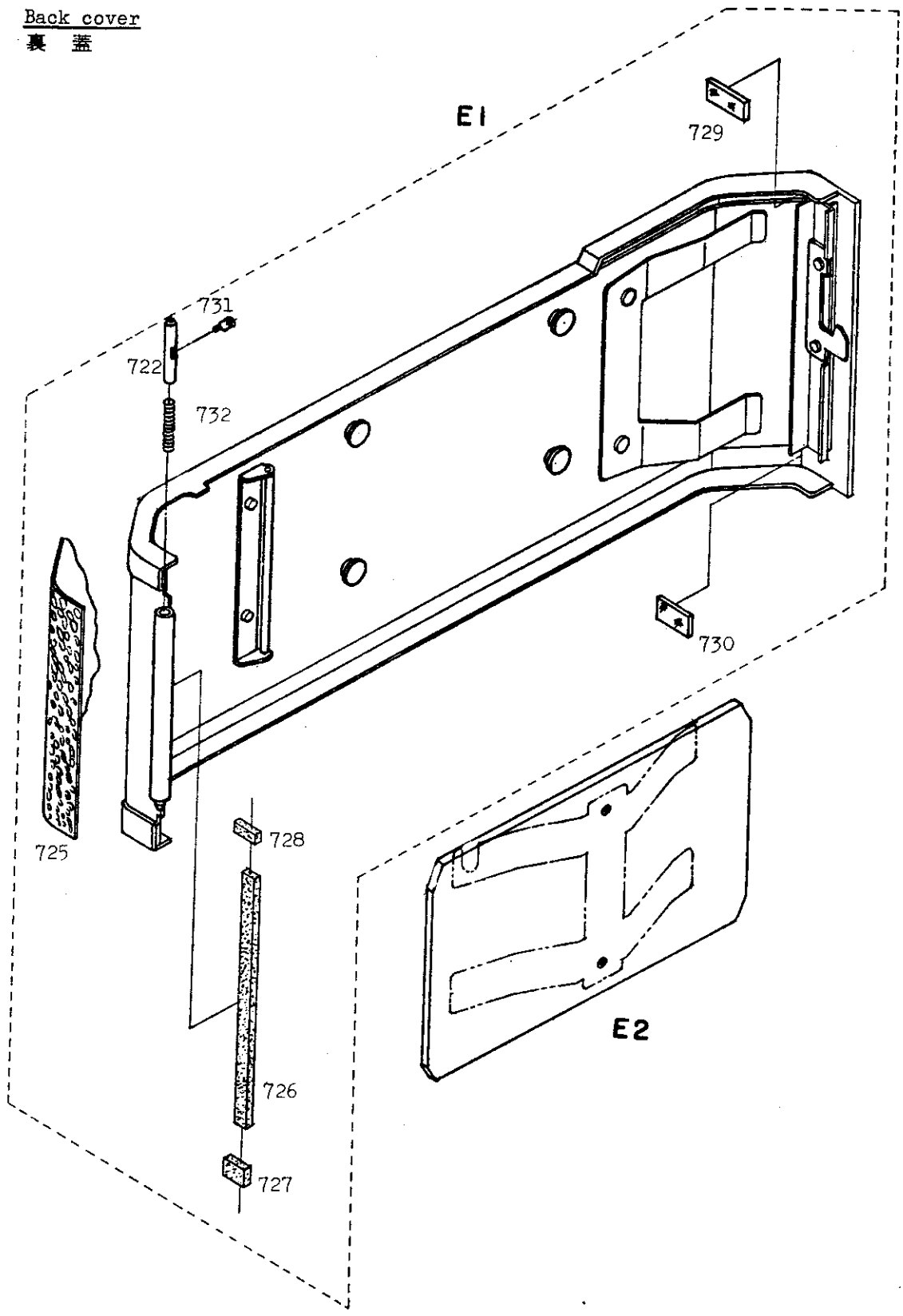
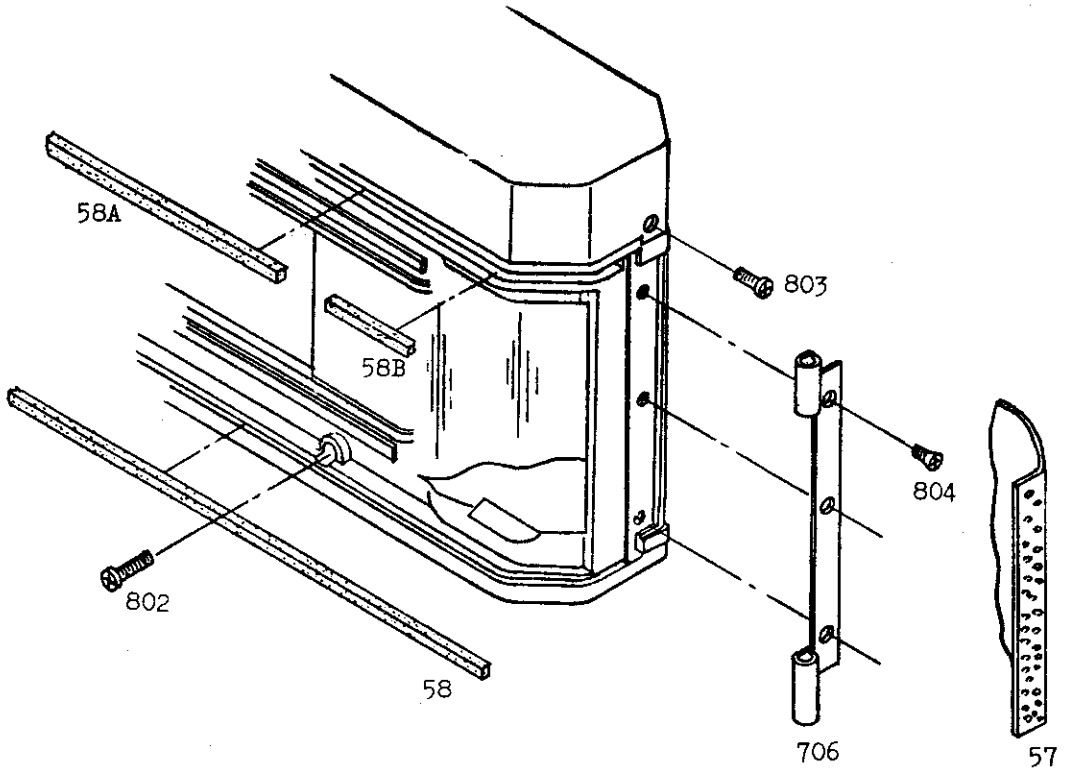


Fig. 15

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
722	Hinge bar B 蝶番芯金B				
725	Back cover leatherette 裏蓋用貼皮				
726	Light-tight A 遮光モルトA				
727	Light-tight B 遮光モルトB				
728	Light-tight C 遮光モルトC				
729	Light baffle cloth A 遮光別珍A				
730	Light baffle cloth B 遮光別珍B				
731	Back cover lock pin 裏蓋着脱ピン				
732	Spring 裏蓋着脱ばね				
			E2	Pressure plate 圧板	
			E1	Back cover 後蓋	

Hinge, Latch
蝶番、止め爪部



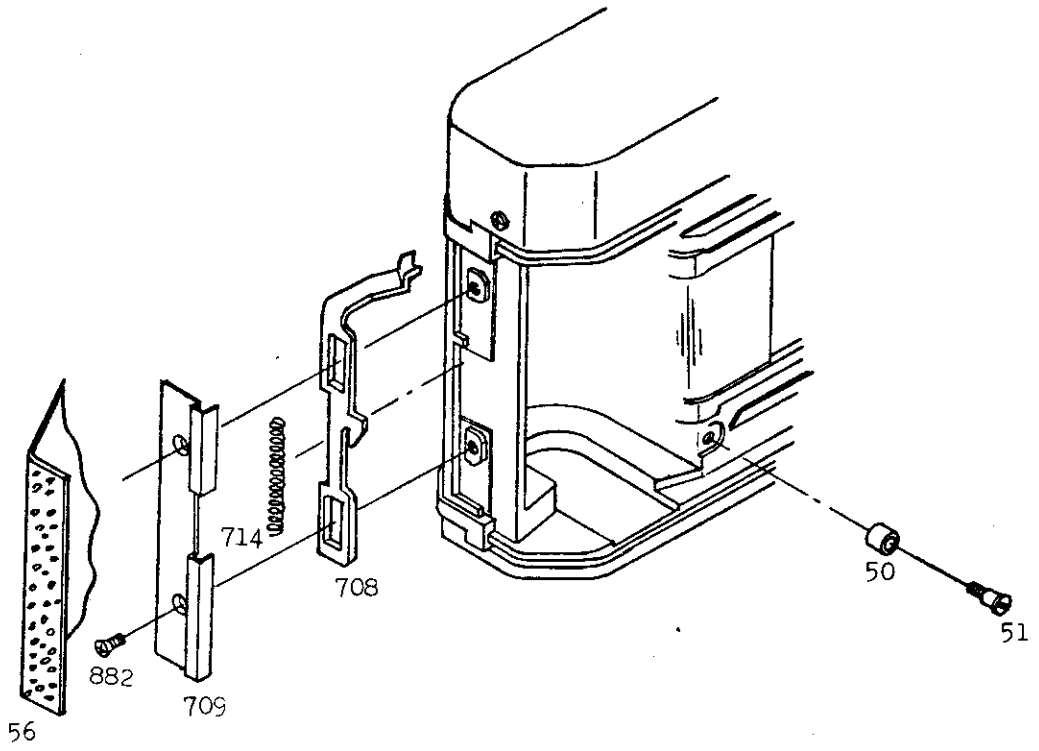


Fig. 16

Part No. 部品番号	Name 名称	Remarks 備考	Part No. 部品番号	Name 名称	Remarks 備考
50	Roller ローラー				
51	Roller shaft ローラー軸				
56	Body leatherette A ボデー擬革A				
57	Body leatherette B ボデー擬革B				
58	Groove tightener 溝用モルトプレン				
58A	Top groove tightener A 上溝用モルトプレンA				
58B	Top groove tightener B 上溝用モルトプレンB				
706	Back cover hinge A 裏蓋蝶番A				
708	Latch B 止め爪B				
709	Latch cover 止め爪カバー				
714	Spring 止め爪バネ (d=0.3)				
802	JCIS ⊕ PM 2×7 Type (1)				
803	JCIS ⊕ PM 1.7×3 Type (1)	32FB-#803			
804	JCIS ⊕ CM 1.7×2.5 Type (1)	32FB-#804			
882	JCIS ⊕ CM 1.7 × 3 Type (1)	32FB-#882			

5. DESCRIPTIONS

Page

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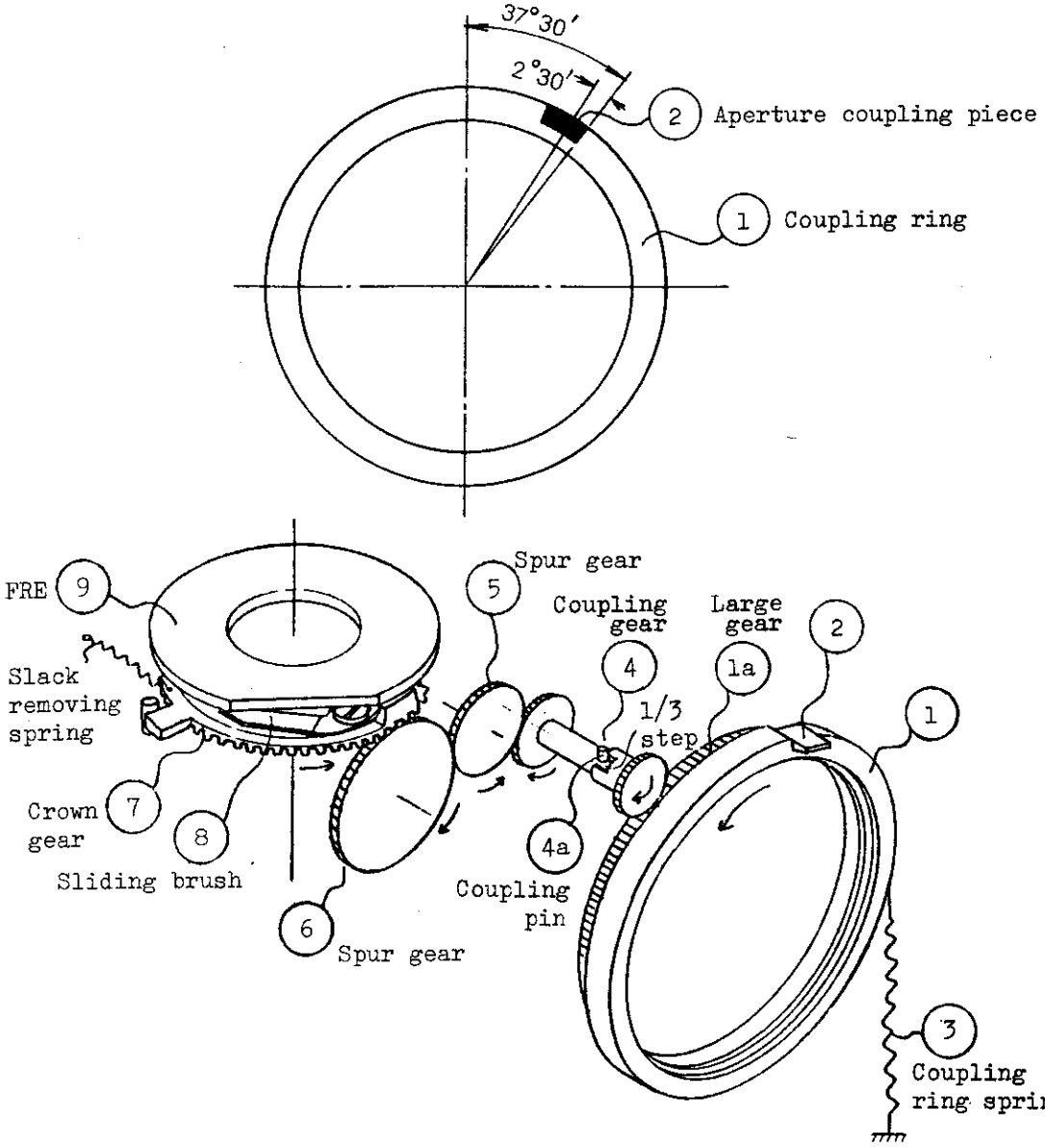
(2) Light measuring circuit ..... 69 — 70

5. DESCRIPTIONS

(1) Aperture coupling unit

The coupling system of exposure meter to aperture diaphragm in the resent type of camera differs from that in our earlier types of camera in that it calls for no compensation setting at the time of mounting the lens onto the camera body, but only attaching of an interchangeable lens, which automatically performs meter coupling to the aperture (in the case of AI lenses).



When the lens is attached to the lens mount in the turned down state of the aperture coupler②, the protrusion on the aperture ring of lens is connected with the aperture coupler②. A series

of gears arranged between the large gear (1a) on the aperture coupling ring (1) and the sliding brush (8) on the FRE (9), constituing from several spur gears (4), (5), (6), crown gear (7), etc. will change the relative positions between the brush and the FRE in proportion to the rotating angle of the aperture ring of lens, thus varying the electrical resistance.

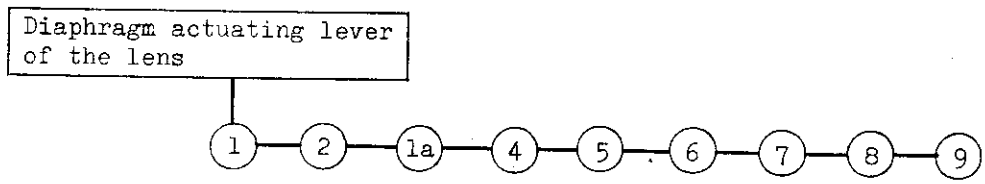
The aperture coupling ring (1), at all times pulled up clockwise by the spring (3), limits the rotation of the coupler (2) to 37°30' as shown in the figure.

The movement of the sliding brush (8), converted to the rotation of the coupler (2), is restricted to a position 2°30' ahead of 37°30', that is, to a position of 35°, by means of another stopper, the angle 2°30' corresponding to 1/3 step of each f-stop.

Whereas for earlier types of camera the lens f/1.4 and f/1.2 necessitate full-aperture compensation, this compensation in the present type of camera is accomplished by the difference between the movement of the sliding brush (8) and the rotation of the coupler (2). In practice, a slack is provided, corresponding to 1/3 step, between the notch on the gear (4) and the pin (4a).

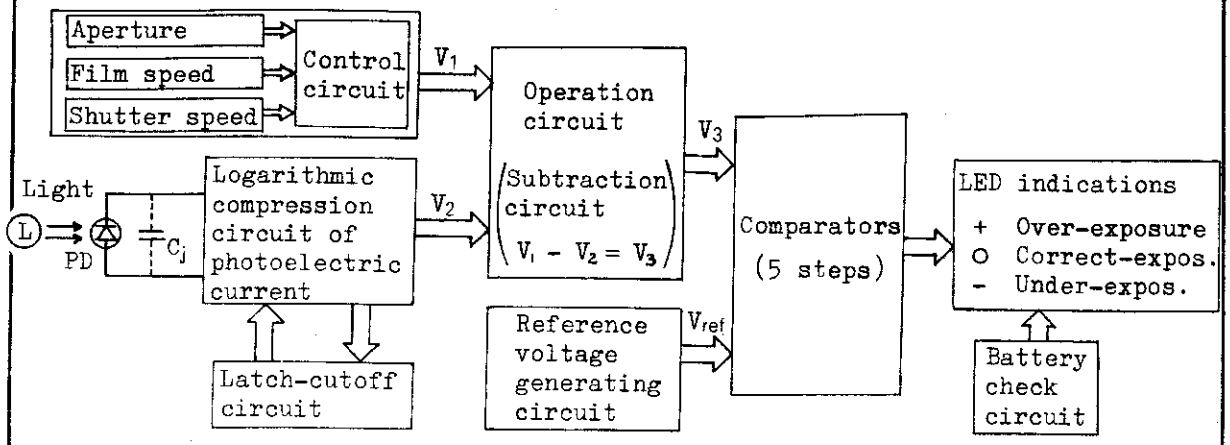
When f/1.4 or f/1.2 lens is mounted at the time of full-aperture, the coupler (2) is engaged at position of 37°30', as shown in the figure, but when a lens of f/2 or smaller aperture is attached, with no need for compensation, the coupler (2) is engaged to the full-aperture at the position where it is rotated counter-clockwise 2°30' from 37°30'. Since the compensations required for the full-aperture of the lens f/1.4 and f/1.2 are 1/3 step and 1/2 step, respectively, the lens f/1.2 may make inevitably over-exposure as far as 1/6 step. However, this does no harm practically, based on our experiences until now.

Order of operation



(2) Light measuring circuit

Fig. 1 Block Diagram



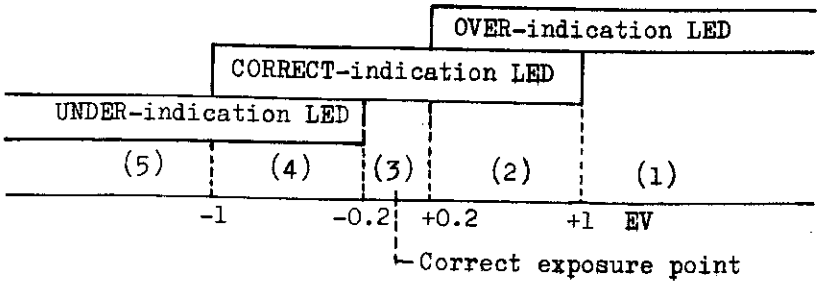
First, informations such as the film speed (ASA), aperture value (f-number) and shutter speed, set to the camera are transmitted to a high-fidelity FRE (thin-film metallic resistor), the change of resistance being converted into its corresponding voltage V_1 by means of the control circuit.
On the other hand, another information such as the intensity of light, causing a change to the photoelectric current in the PD (GaAsP photo-diode), placed in the optical path of the finder, is converted into a voltage V_2 corresponding to the intensity of light by means of the logarithmic compression circuit. Such photoelectric current in the PD, though not influenced by antecedent effects and showing an excellent lineality from high to low brightness, is yet quite sensitive to noises at the time of connection with a power source or speedlight, on account of its minuteness on the side of low brightness. Not only that, owing to the junction capacitance of the PD itself, the current has an injurious effect (latch) on the pre-amp circuit. For example, if a junction capacitance of PD be C_j=700pF, a photoelectric current at low brightness be i_L=50pA, when a voltage noise V_n=1V enters the PD, the time (t) required for removing the charge accumulated in C_j will be

$$t = \frac{C_j \, V_n}{i_L} = 14\text{sec.}$$

Thus, during this time the light measuring circuit may be unstable. Therefore, to avoid such a defect, the equipment has a latch cutoff circuit which stabilizes the light measuring circuit within 0.5sec., because it detects the latched pre-amp signal and is forced to remove the charge accumulated in the junction capacitance of the PD caused by noise.

In the operation circuit, subtraction of two voltages $V_1 - V_2$ brings about a voltage V_3 corresponding to the correct exposure. Furthermore, this voltage, compared with the output voltage V_{ref} obtained from the reference voltage generating circuit, is divided into 5 steps by means of 4 comparators. These 5 exposure steps are indicated, as shown in Fig.2, by the use of 3 LEDs (light emitting diodes) --- (1) and (2) OVER-exposures, (3) CORECT-exposure, (4) and (5) UNDER-exposures. Namely, lighting only of the central, correct exposure indicating LED shows a range within ±0.2EV from the correct exposure point, and both of the other two, a range -1EV — -0.2EV or +0.2EV — +1EV.

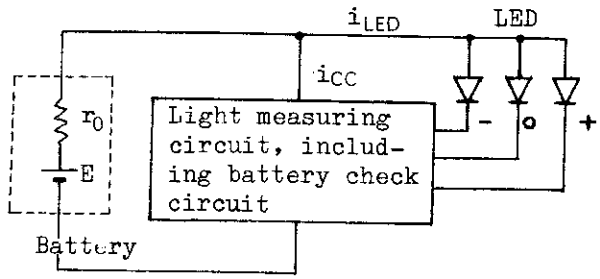
Fig. 2 5-step Indications of LEDs



The driving current for these LEDs is kept constant to ensure a constant brightness in spite of variation of the power voltage. Beside, since the temperature factor of light emitting efficiency of LED is minus, that of driving current for LED is made plus, so that the brightness is kept constant in spite of temperature change. The life of the battery is thus elongated. In addition, the above circuit, including a battery check circuit, extinguishes the LED at a voltage lower than the circuit operating voltage.

With regard to the light extinction circuit, we have in general the formula as below:

Fig. 3 Circuit



$$E - r_0 (i_{LED} + i_{CC}) = (\text{Battery voltage})$$

where r_0: Internal resistance in the battery

E : Open voltage of the battery

i_{CC}: Light measuring circuit current

i_{LED}: Driving current for LED

The value r_0, when the battery is used at a lower temperature, or in an older battery, is so much increased, and thus the battery voltage so much droped. If the voltage is lower than the battery check point, LED will go out, but i_{LED} becomes zero, the battery voltage rising $E - r_0 \cdot i_{CC}$, and the LED will light again. Therefore, this process is repeated until $E - r_0 \cdot i_{CC}$ becomes lower than the battery check point.
As the repetition goes rapidly, if the LED is viewed with the eye, it is seen slowly darker, after the extinction is started, telling us the necessity of replacement of the battery. So long as LED is seen bright, the measuring circuit operates normaly.

Electrical characteristics for reference:

Power requirement in the light measuring circuit, including driving current for LED	One of LEDs lights	2.3 mA
	Two of LEDs light	3.2 mA
Battery check voltage	2.24 V	
Temperature range for use	-20° C —— +60° C	

6. DISASSEMBLY, REASSEMBLY AND ADJUSTMENT

Page

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(2) Reassembly and adjustment

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⑥ Ratchet cam, pendulum 77
⑦ Sprocket stopper, sprocket 78
⑧ Counter eccenter axle, wind-up gear, wind-up cam 79
⑨ Upper bracket 79
⑩ Upper bracket K, counter dial K7 80
⑪ Wind-up lever 80
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⑬ Charge lever, MD wind-up switch 82
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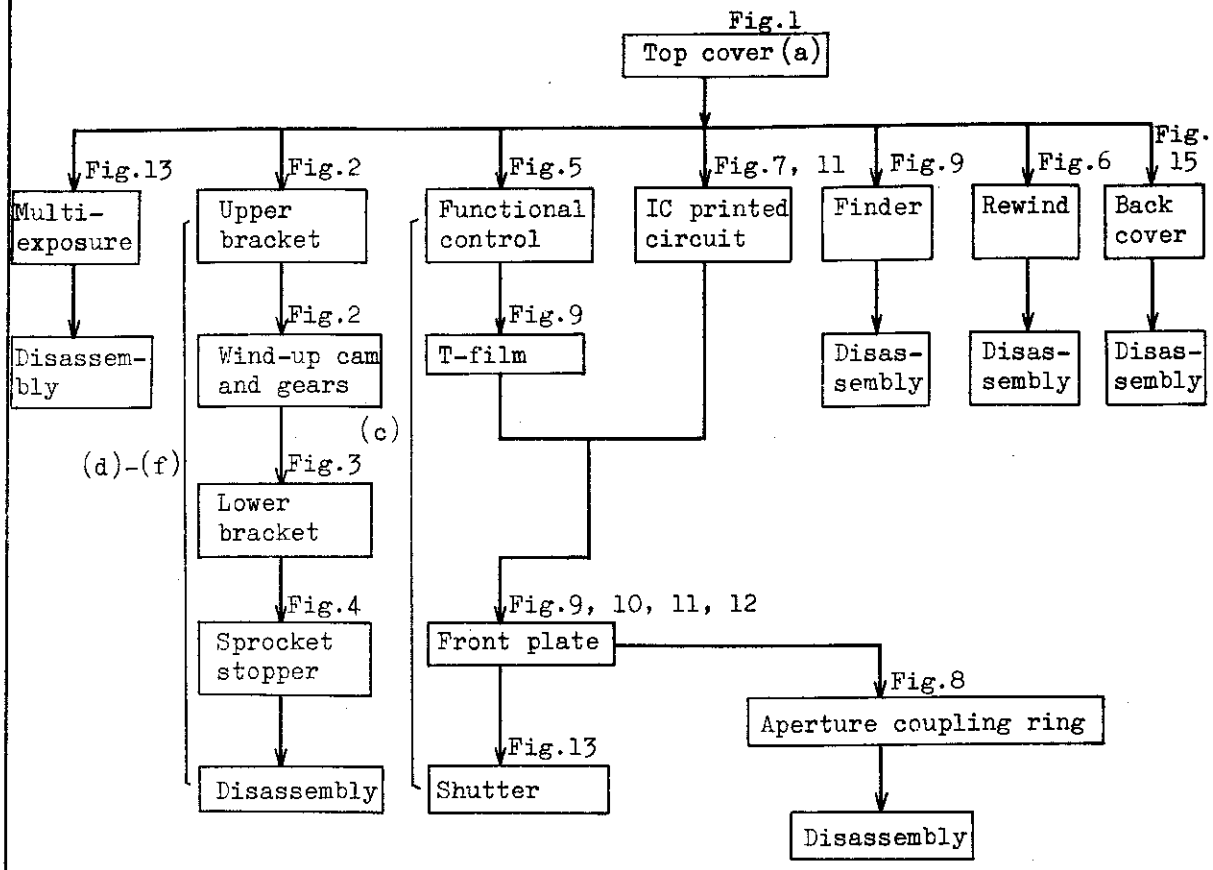
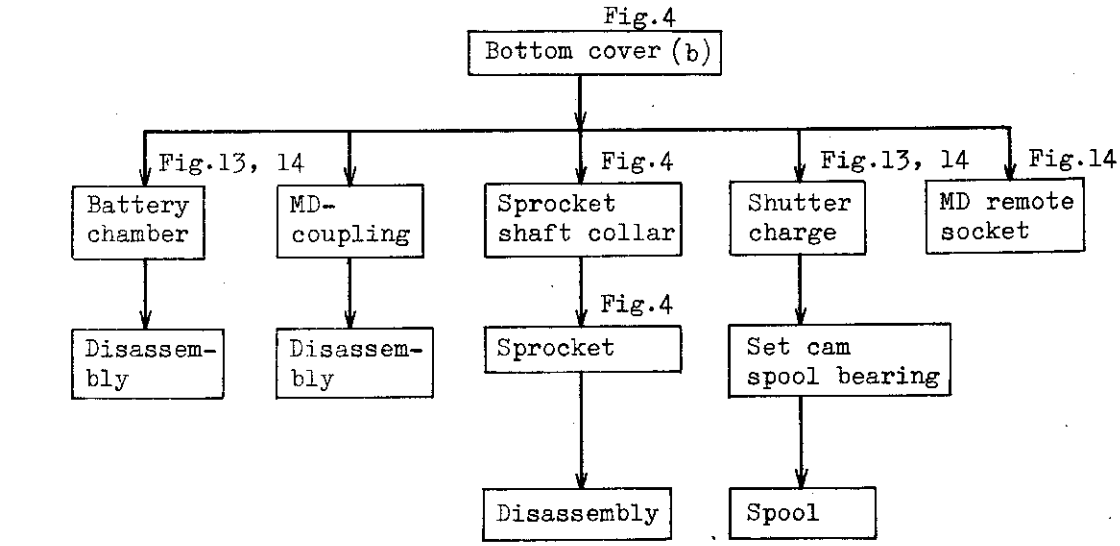
Note: For the figure numbers in the Flow charts, refer to the Exploded drawings.
The parts enclosed with (#) are not available as those for repairing.
Abbreviations:

[D] ..... Disassembly
[R] ..... Reassembly
[N] ..... Caution to be taken (Note)
[C] ..... Check point
[T] ..... Tool to be used
[L] ..... Lubricant to be applied
[B] ..... Binding agent to be applied (Refer to p.3, p.4)
[A] ..... Adjustment
⊕ ..... Cross recessed head screw
⊖ ..... Slotted head screw

(1) Flow chart for disassembly

1) Roughly sequence of disassembly





2) Sequence of disassembly for each unit

(a) Top cover

Fig.1 Wind-up lever leatherette #402
↓
Wind-up lever screw #403
↓
[T] Screwdriver J11126
↓
Wind-up lever P3
↓
Dial knob #543, ⊕#869 x 3
↓
Rewind knob H
↓
Spring #656, washer #660 and friction spring #662
↓
Knob clip #659
↓
[T] Special pincers J5273
↓
Cover ring #661
↓
Fig.6 [N] Use alcohol
Spring #655 and spring #663
↓
Back cover lock knob #664
↓
Rewind shaft guide #665
↓
Rewind shaft #652
↓
Fig.1 Top cover C, ⊕#803 x 5
↓
Fig.9 Shoulder cover, right #39 and left #40
↓
Fig.13 Release middle shaft #527A and spring #527B

(b) Bottom cover

Fig.14 Battery chamber cap (#44)
↓
Bottom cover D, ⊕#804 x 3

(c) Front plate and shutter

Fig.7 Unsolder leads #152, #154, #160, #177 and #178
↓
Fig.9 Eyepiece mold N4, ⊕#817 x 2
↓
[N] Do not drop washer #824
↓
Fig.11 IC printed circuit M, ⊕#801 x 1, ⊕#817 x 1
↓
Fig.13 Multi-exposure arm A #490 and spring #492, ⊖#494
↓
Fig.5 Spring #581 and screw #600
↓
[T] Screwdriver J11131
↓
FRE stopper #596, ⊕#845 x 1
↓
Functional control F, ⊕#845 x 1
↓
Fig.13 Shoulder screw #579
↓
[T] Screwdriver J11130
↓
Fig.9 T-dial pulley F7
↓
[N] Do not take off click pulley
↓
Fig.16 Body leatherette-A #56 and -B #57
↓
Fig.9 Front plate B, ⊕#817 x 1, ⊕#810 x 5
↓
Fig.13 Mirror box rear light-tight #82
↓
Shutter, ⊕#840 x 2, ⊕#802 x 1
↓
[N] Unsolder green sync lead
↓
Shutter top cover #62

(d) Upper bracket, lower bracket

Switch stopper lever P4 and spring #476, ⊖#473 x 1

Fig.2 Upper bracket K, ⊖#494A x 1, ⊕#807 x 1

[N] Remove screw through the notch in index plate #533, taking caution not to scratch the plate.

Unsolder #162 (blue), #164 (violet)

Fig.3 Screw ⊖#815 (left handed)

Sprocket stopper spring #496 and sprocket stopper screw #888

Wind-up gear A18, charge cam #413

[N] Remove cam together gear

Lower bracket, ⊕#807 x 3

Unsolder #151 (red), #176 (orange)

Fig.4 Spool top gear A7

[N] Don't drop ball bearing!

(e) Spool

MD coupling #923, ⊕#820 x 1

Fig.14 Bottom retaining plate #31, ⊕#809 x 3

Charge lever #A4, cam collar #460

Set cam A10, ⊖#815x1, ⊖#833x1

[N] Left handed

Fig.4 Spool shaft bearing A14, ⊕#825 x 3

Spool shaft A9

Spool A8

(f) Sprocket

Fig.4 Sprocket shaft collar B #499, collar C #499A

[N] Left-handed
[T] J11128

Screw (left-handed) #887

[T] J11129

Sprocket stopper cam #429

Sprocket upper gear #431

Sprocket screw ⊖#435 x 1

[N] Remove sprocket shaft pulling slantwise toward bottom cover side.

Sprocket shaft bearing #438

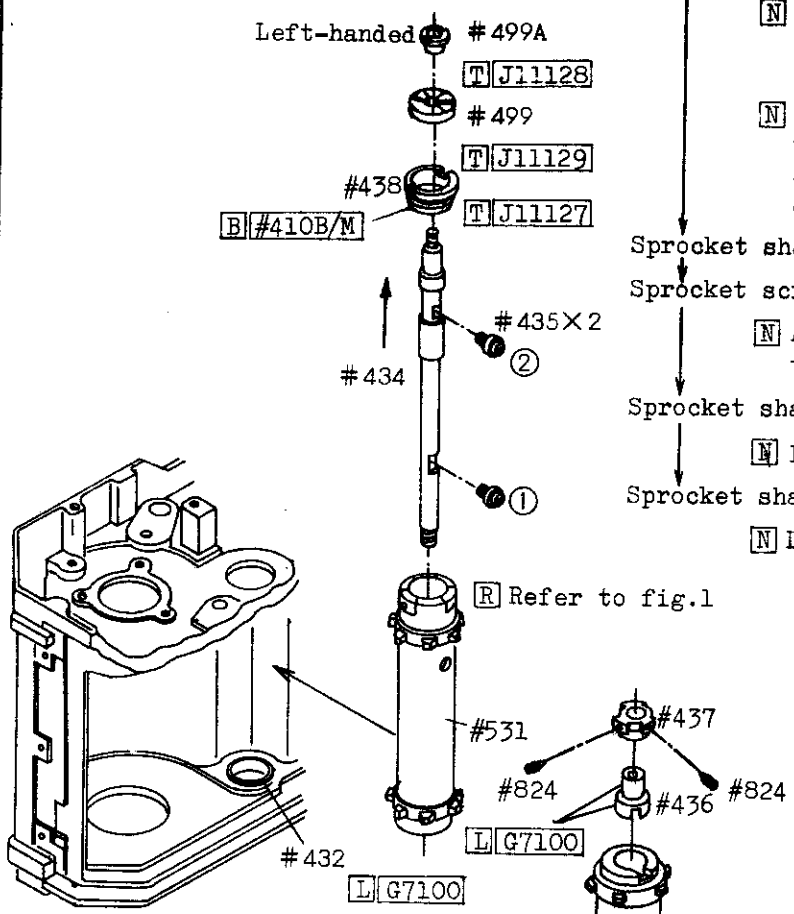
[T] J11127

Sprocket

Note: For reassembly, reverse disassembly procedure.

(2) Reassembly and adjustment

① Reassembly of sprocket



Sprocket #531

N Beforehand, assemble spring and collar into sprocket, as shown in fig.1.

N Pulling sprocket shaft #434 upward in the direction of arrow, insert slantwise the sprocket into bearing #432.

Sprocket shaft bearing #432

Sprocket screw #435×1

N Attach screw ② through the hole in the sprocket.

Sprocket shaft collar B #499

N Left-handed

Sprocket shaft collar C #499A

N Left-handed

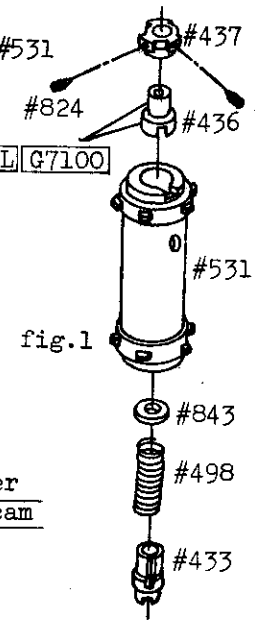


fig.1

Sprocket #531

Sprocket collar A #436

Sprocket collar A nut #437 (Lock set screws #824×2)

Washer #843

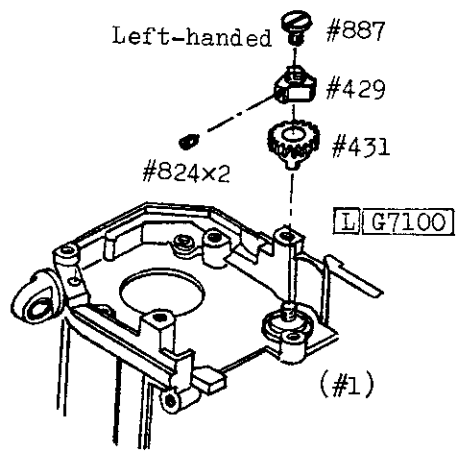
Spring #498

Sprocket shaft #434

Screw #435×1 (Screw ①)

Sprocket collar #433

② Reassembly of sprocket upper gear and sprocket stopper cam



Sprocket upper gear #431

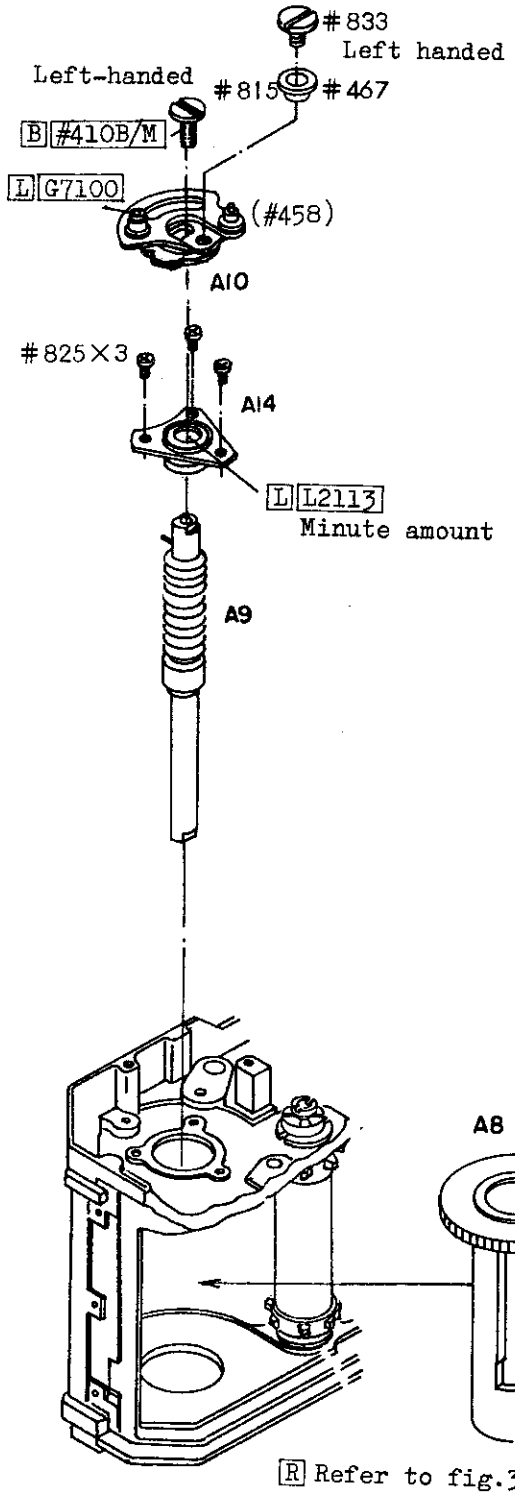
Sprocket stopper cam #429

R N For positioning stopper cam, refer to paragraph ⑦. Fasten up tentatively set screws #824×2.

N Screw in stopper cam #429, so that it is flush with the top end face of #434.

Screw #887 (left-handed)

③ Reassembly of spool



Spool A8

↓

Spool shaft A9

↓

Spool shaft bearing A14, ⊕#825×3

N Insert end of spring #529 into slit of bearing A14. (For positioning, refer to fig.2)

↓

Set cam A10

N Give the shaft A9 one turn clockwise, then attach bearing A10.

↓

Wind-up shaft screws, ⊖#815×1 (left handed), collar #467, ⊖#833×1 (Left handed)

C After reassembling, make sure of correct returning of set cam A10.

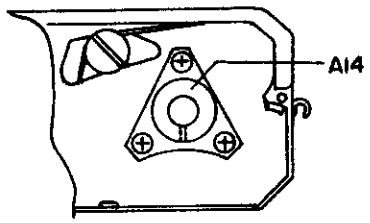


fig.2

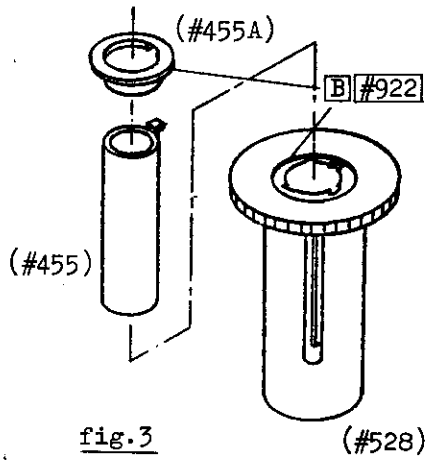
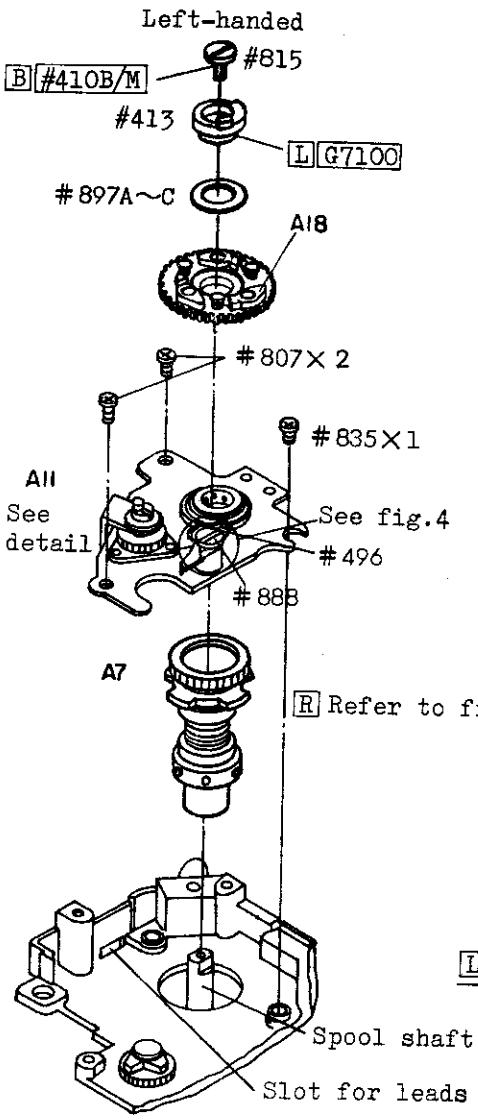


fig.3

④ Reassembly of spool top gear, lower bracket, wind-up gear



Spool top gear A7

↓ N Rotating spool, let friction plate #456-1 drop into inside groove of spool.

Lower bracket A11, ⊕#807×2, ⊕#835×1

↓ N Rotating spool, attach the bracket A11 in the most smoothly rotating position.

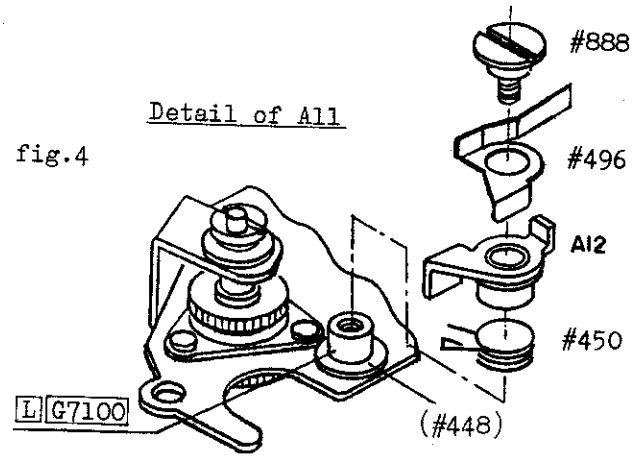
Wind-up gear A18, charge cam (#413), washer #897A—C (t=0.05, 0.1, 0.2mm)

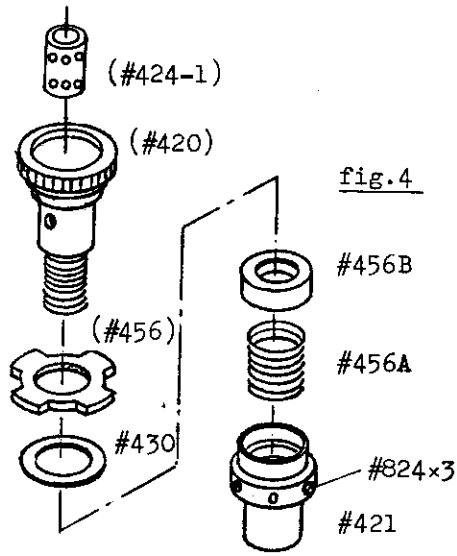
↓ N For positioning, refer to paragraph ⑧.

Wind-up screw ⊖#815×1 (left handed)

↓

Soldering #151 (red), #176 (orange)

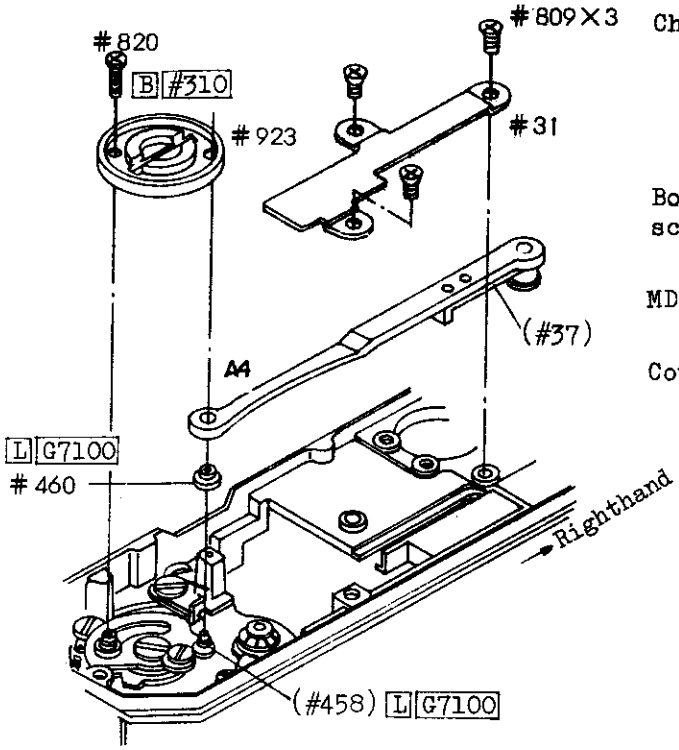




Specified friction of spool:
125—157g·cm

R A For adjusting friction, releasing set screws #824×3, move nut #421 vertically.

⑤ Reassembly of shutter charge lever, MD coupling



Cam collar #460

↓

Charge lever A4

N Bringing (#37) to the right side of charge pin, put #460 into the hole of A4.

↓

Bottom retaining plate #31, screws ⊕#809×3

↓

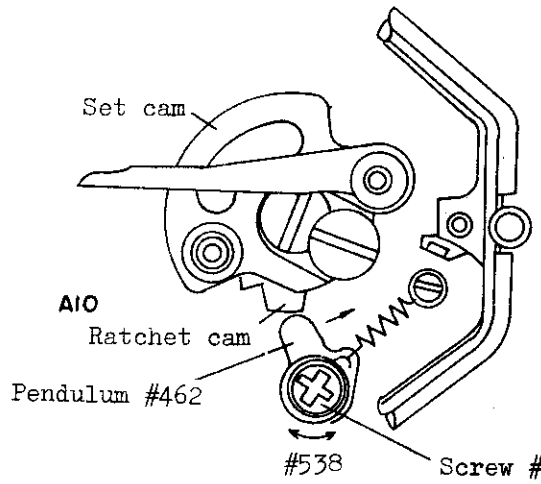
MD coupling #923

↓

Coupling screw #870

C Shutter should be positively charged, after wound up gently.
Be sure of positive returning of set cam.

⑥ Adjustment of ratchet cam, pendulum

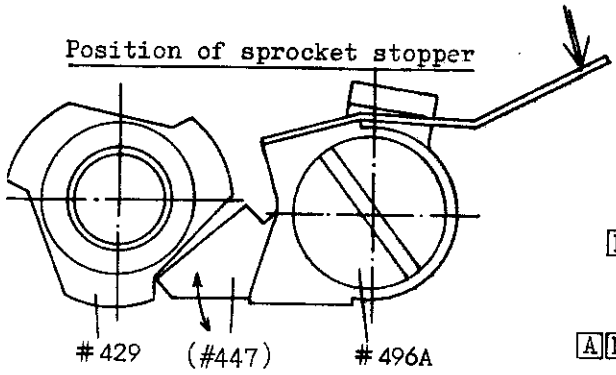


Positional relation of wind-up stopper to pendulum

Clearance between pendulum #462, disengaged from ratchet cam A10, and wind-up lever coming to the limit, is to be 0—0.2mm.
For adjustment, maniplate pendulum eccenter axle #538.

C After adjustment, make sure of correct charging and possibility of winding-up in spite of rapid or slow and strong or weak winding-up manipulation.

⑦ Positioning of sprocket stopper, sprocket

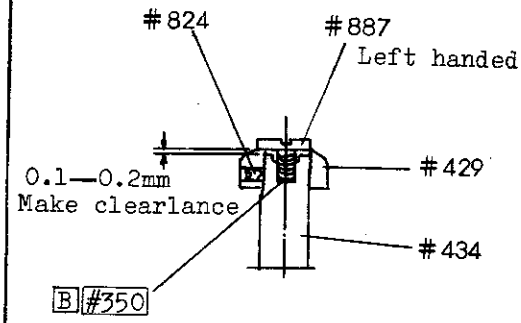


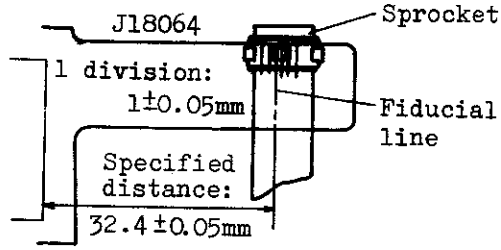
Bringing wind-up lever to the limit, adjust slack by changing clearance between (#447) and #429.
Specified slack: Within 0.8mm (at the top of each sprocket tooth)

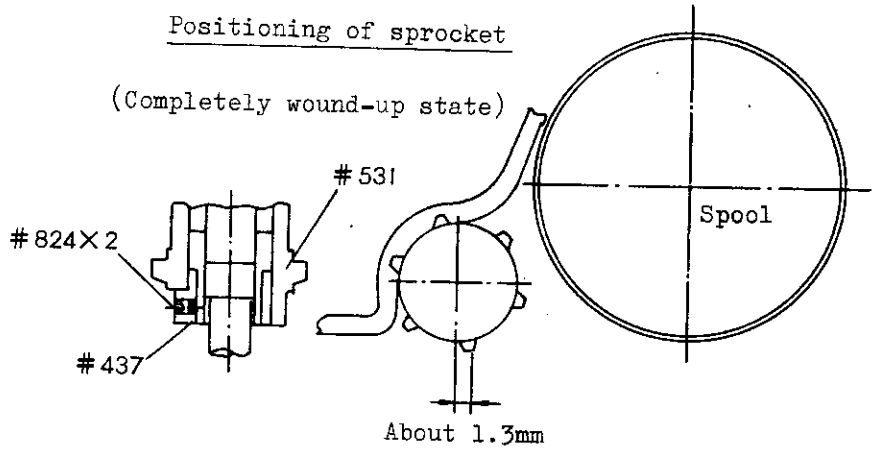
[N] Winding up lever three times, see that slack is within 0.8mm at all positions of #429.

[A][N] In positional adjustment, maintain a clearlance of 0.1—0.2mm between #429 and #434, as shown in left-hand fig.

[T][C] For checking slack, use slack check tool J18064.





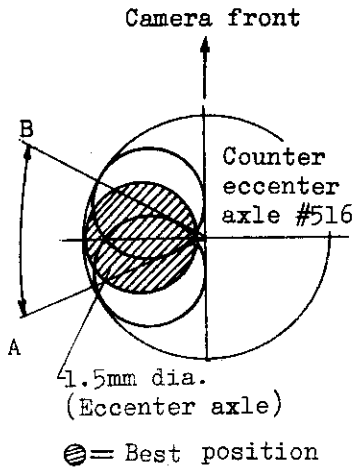


[A] Set the lever to completely wound-up position, and release screws #824×2.

[T] Use tool J18064.

[C] Correct position of the tooth of sprocket is to be within 1.3mm, as shown in fig. above.

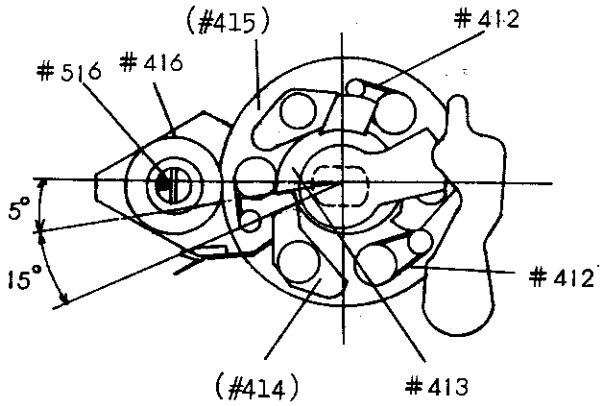
⑧ Positioning of counter eccenter axle #516, wind-up gear A18 and wind-up cam #413



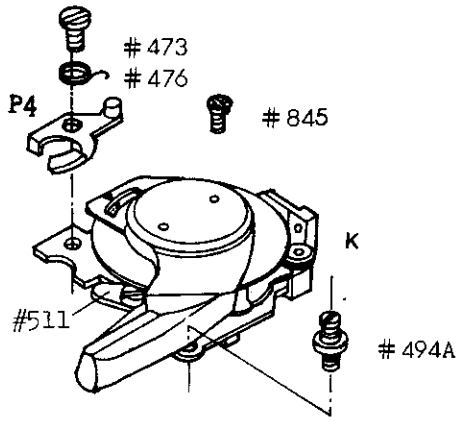
Completely wound-up state

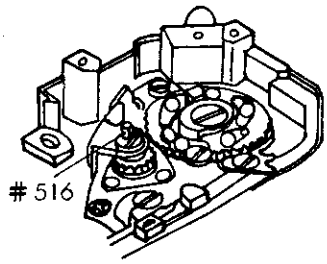
[R] Assemble wind-up gear A18 and wind-up cam #413 in a completely wound-up state. Engage (#415) to #416 so that axle (1.5mm in dia.) #516 comes within the range A — B as shown in lefthand fig.

[N] Relative position of wind-up cam #413 to charge cam claw (#414) is to be such that claw end comes to about 20° from the center line, as shown in fig. below.



⑨ Reassembly of upper bracket





Upper bracket K

[N] Settle wind-up lever in its flush position, attach screws ⊖#494A×1 & ⊕#845×1.

[N] For screwing in ⊕#845×1, turn counter dial up to notch.

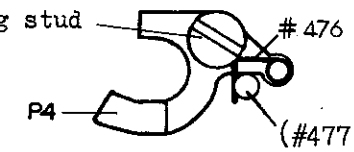
MD switch stopper P4, ⊖#473×1

[N] Position of stopper spring is as shown in fig. below.

[N] Screw in ⊖#473, turning the dial up to notch.

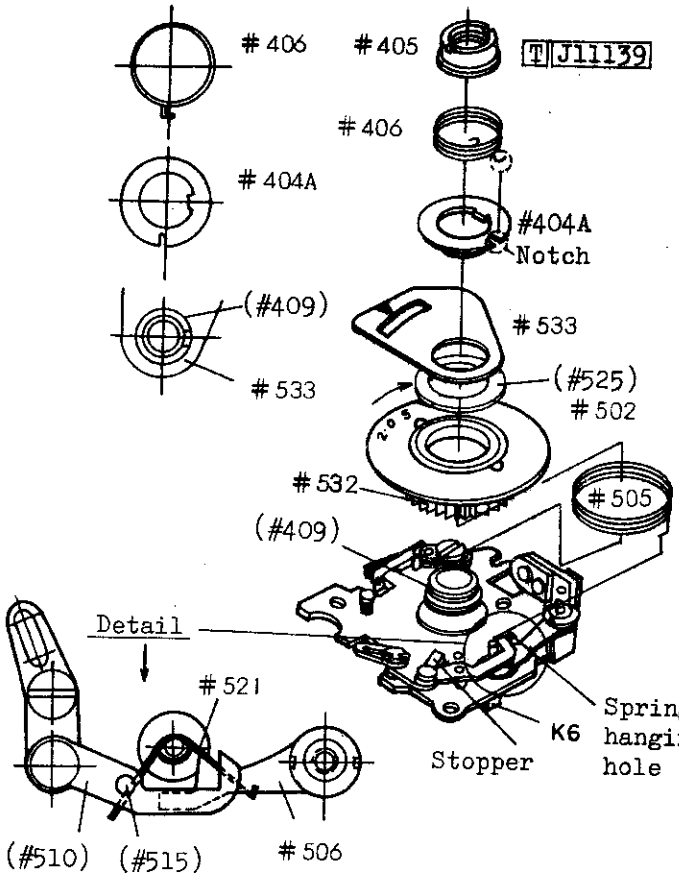
Soldering of #162 (blue), #164 (violet)

Twist the spring under insulating collar!



[C] After attaching upper bracket K, close the camera back, and in this state see that the dial advances correctly (without jump, double counting, no-counting, etc.), and check correctly return of the dial.

⑩ Attaching of upper bracket K, counter dial K7



Hanging position of spring #521

Counter spring #505, counter dial #502, ratchet #532, washer (#525)

R Insert spring #505 into spring hanging hole in upper bracket (#451). Hang #505 on ratchet of K7. Turn K7 one rotation clockwise and turn it back to stopper.

Index plate #533

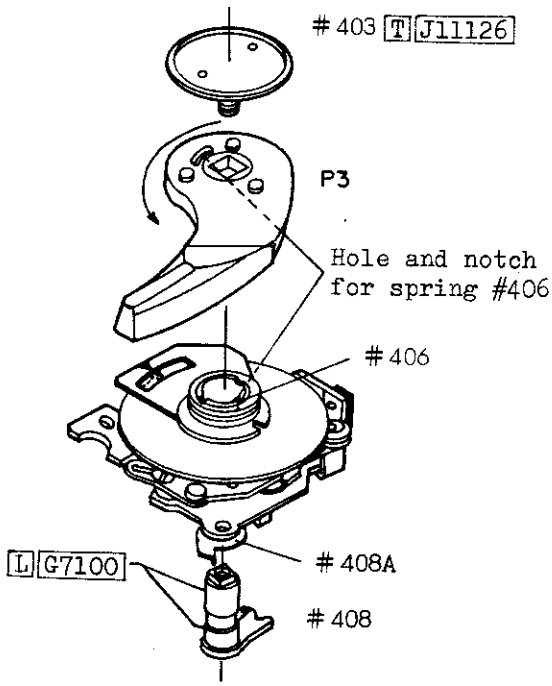
R Hang spring #406 on the notch of ring #404A, and insert it into (#409).

Lever axle nut #405

A Bring index ▼ on #533 opposite S on counter dial, and fasten #405 tightly.

C Rotation of dial #502 must be smooth.

⑪ Attaching of wind-up lever

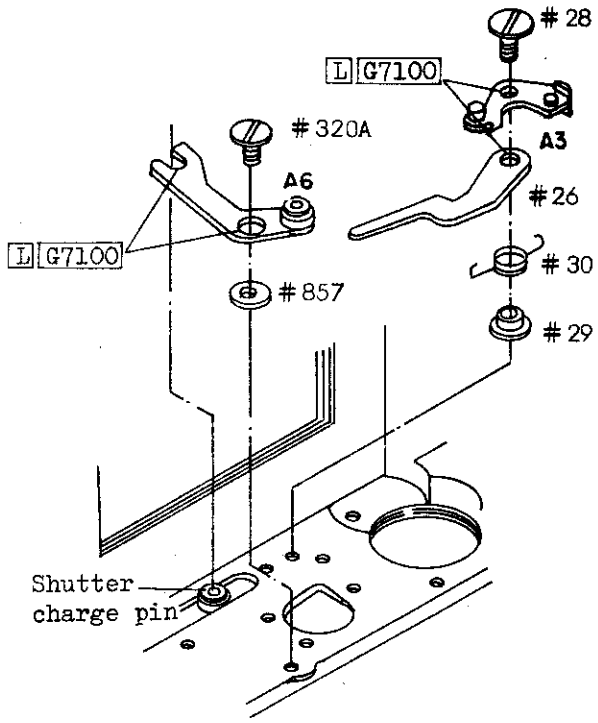


Tentative attaching of wind-up lever P3

R Hang spring #406 on lever P3. Wind it up about one rotation, and fasten it with screw #403 in position.

C Movement of lever P3 should be smooth.
Thrust slack of P3 is to be within 0.13mm.

⑫ Attaching of charge lever, MD switch coupling lever, battery chamber



Body

↓

Charge lever washer #857,
charge lever A6

N Fit forked end of lever A6 to shutter charge pin.

↓

Charge lever axle #320A

↓

Blank shot check lever collar #29,
MD signal lever spring #30

↓

Blank shot check lever #26

↓

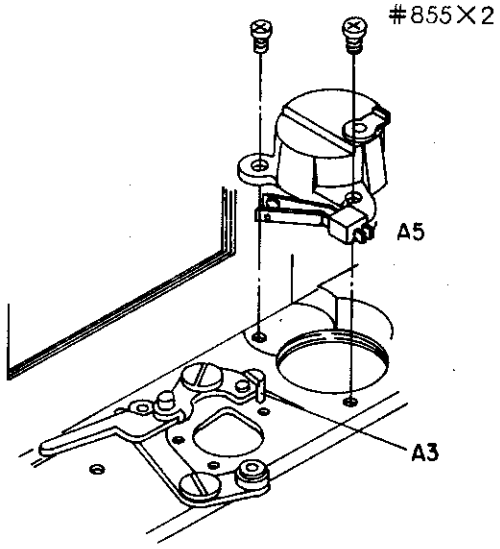
MD switch coupling lever A3

N Vertical slack of lever: About 0.1mm

↓

Signal lever axle #28

C Wind up and then turn the lever gently. Make sure of settling of charge pin onto #26, before pendulum is released.



Body

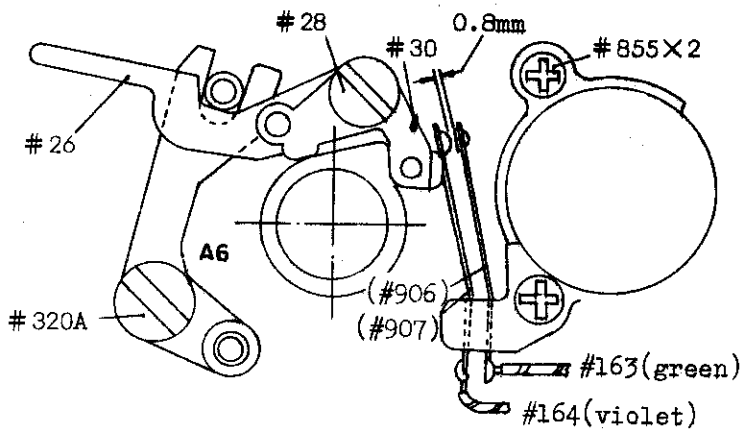
↓

Battery chamber A5, ⊕#855×2

N For adjusting MD wind-up switch, refer to paragraph ⑬

⑬ Adjustment of charge lever, MD wind-up switch

Completely wound-up state

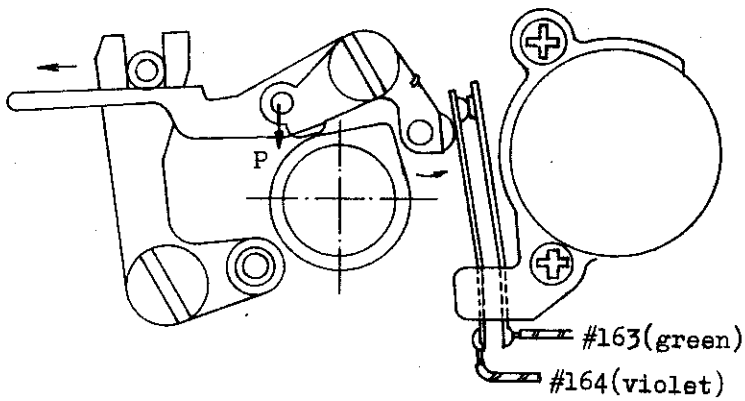


(MD wind-up switch turned OFF)

[C] Switch contact A (#906) should separate from contact B (#907) to some extent (0.8mm).

[A] If not, bend wind-up switch contact A (#906) and/or B (#907).

Halfway wound-up state



(MD wind-up switch turned ON)

Specified contact pressure: About 50 — 60g

[C] Through the whole time of wind-up, MD wind-up switch should be kept turned ON positively.

⑭ Attaching of click pulley and stretching of T-dial string

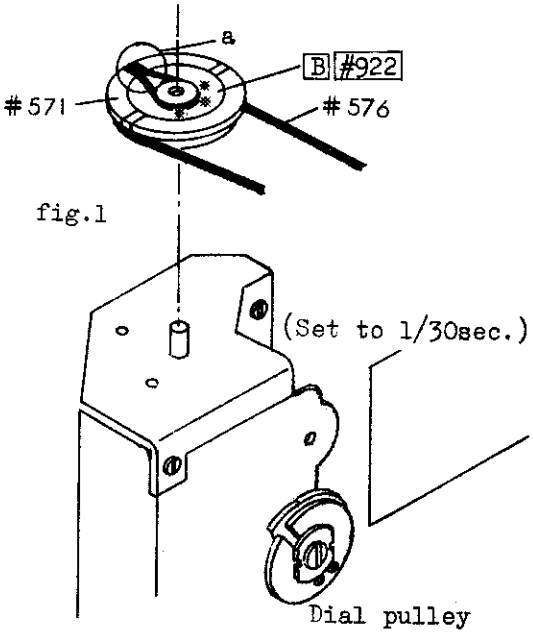


fig.1

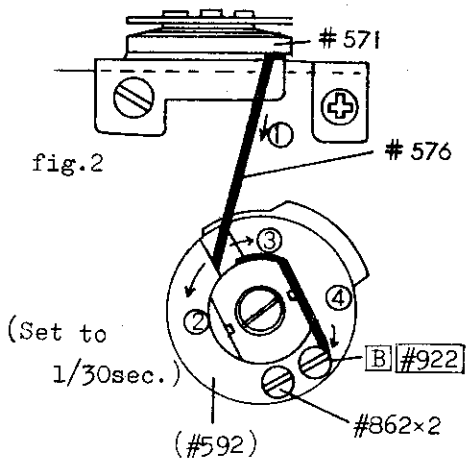


fig.2

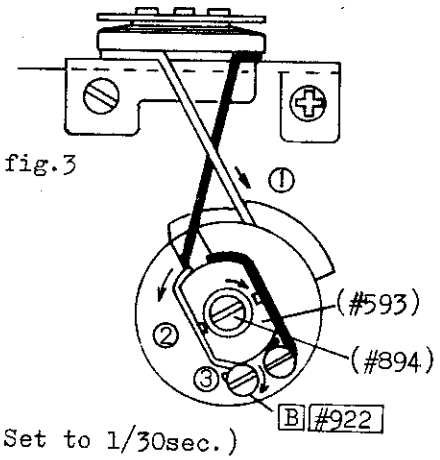


fig.3

Attaching of click pulley #571 and stretching of T-dial string #576

[R] Encircle and adhere the string #576 round inner boss of the pulley #571, as shown in fig.1.

[N] Stretch the string #576 tightly, and apply a little amount of adhesive within the area with ✻-✻-✻, as it is liable to spread out.
String should be gathered (not crossed) at a, as shown in fig.1

Stretching of string

[R] Set click pulley and dial pulley to position 1/30sec. (See fig.2 and fig.3)

Stretching-(1)

[R] Turn the string counterclockwise in the direction of arrow, and attach it onto screw ⊖#862, as shown in fig.2.

[N] Winding direction of string on screw ⊖#862 should be clockwise. At this time, dial pulley (#592) is liable to turn, hold it firmly.

Stretching-(2)

[R] Then, turn the other portion of string clockwise in the direction of arrow, as shown in fig.3, attach it onto another screw⊖#862.

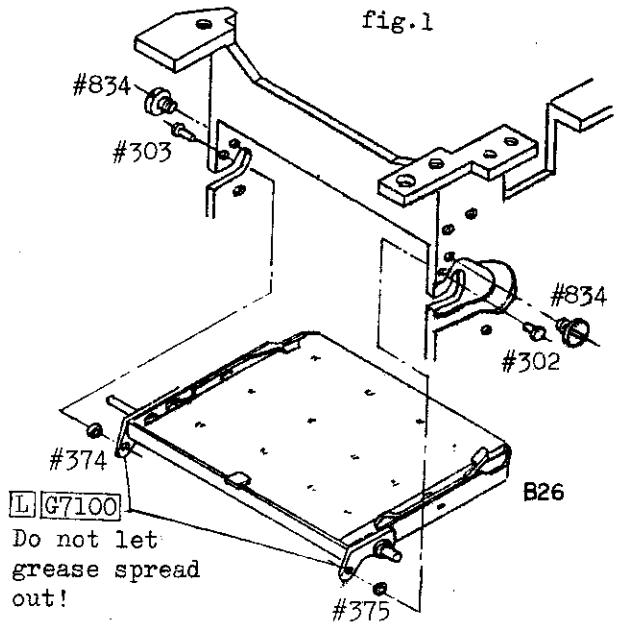
[N] Winding direction of string on screw ⊖#862 should be clockwise.

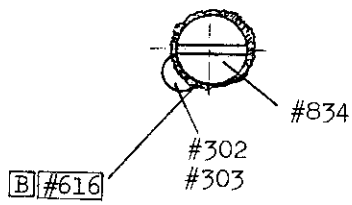
[B] Cut off superfluous portion of string, and adhere its ends to screw ⊖#862×2.

[C][A] If the string is found loosend, release screw (#894) and turn (#593).
After tighten up, attach shutter dial tentatively to check for smooth rotation (without heaviness, unevenness and seizure).

⑮ Reassembly of front plate (mirror, mirror holder, stop-down lever unit)

fig.1





Front plate (#6)

↓

Mirror holder B26

N Take caution not to scratch or soil the coating surface.

↓

Washer #375

↓

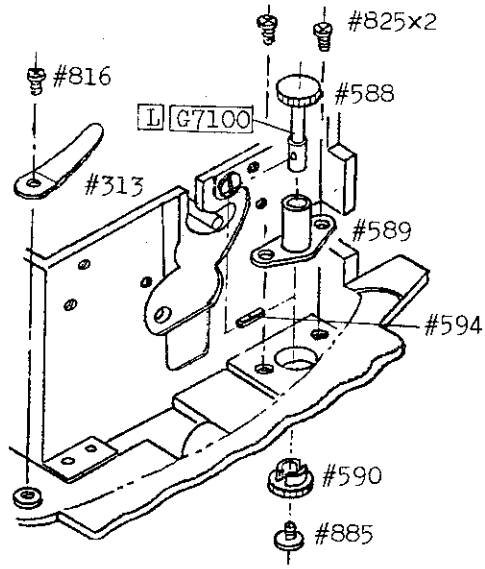
Collar #374

↓

Mirror shaft (wind-up side) #302, (rewind side) #303, ⊖#834×2

N Thrust play on the axles of mirror holder B26 is to be within 0.3mm, and the holder should move smoothly (without any seizure).

fig.2



Front plate (#6)

↓

Gear #588

↓

Gear bearing #589

↓

Spring pin #594

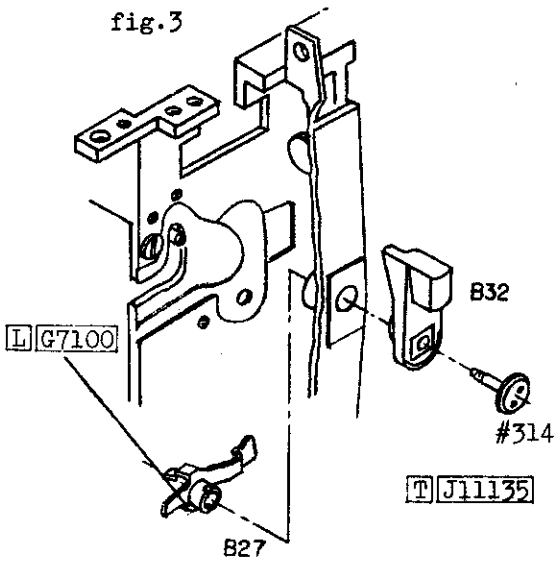
↓

Screw ⊕#825×2

↓

Front pinion #590, ⊖#885

fig.3



Front plate (#6)

↓

Stop-down lever spring #313, ⊕#816

N As shown in fig.3-1, set #313 parallel to the edge of the step of (#6).

↓

Stop-down lever B32

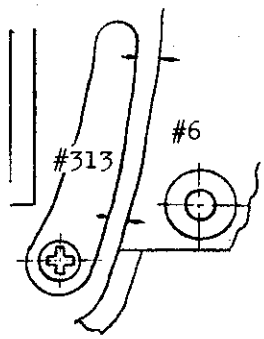
↓

Stop-down coupling lever B27

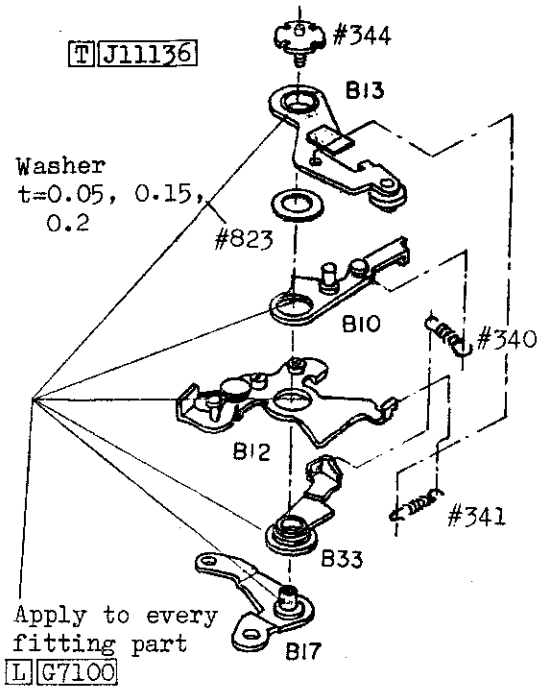
↓

Stop-down lever screw #314

fig.3-1



⑯ Reassembly of front plate (mirror-up lever unit)



Mirror lever base plate B17

↓

Spring stud #376

↓

Mirror-up lever B12

↓

Stop-down coupling lever B10, washer #823

N For removing slack, use washer #823. (t=0.05, 0.1, 0.2mm)

↓

Mirror-down lever B13

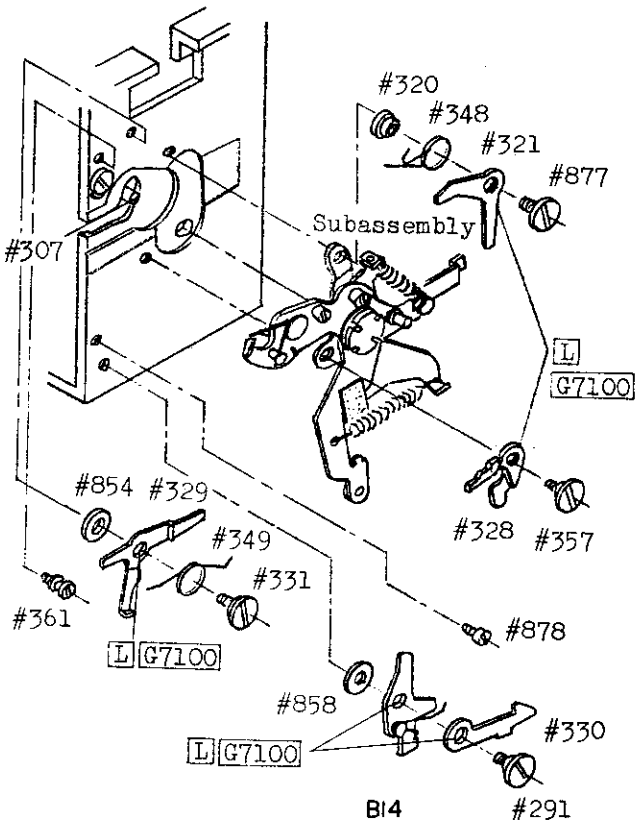
↓

Mirror-down lever screw #344

↓

Stop-down lever spring #340, mirror-up spring #341

C Every lever should move smoothly.



Front plate (#6)

↓

Subassembly (B10, B12, B13, B17)

↓

Signal lever #328, ⊖#357×1

N The lever should move smoothly.

↓

Shutter release lever #321, collar #320, spring #348, axle #877

N The lever should move smoothly.

↓

Mirror-up stop lever #329, spring #349, axle #331, washer #854

↓

Mirror-down signal lever B14

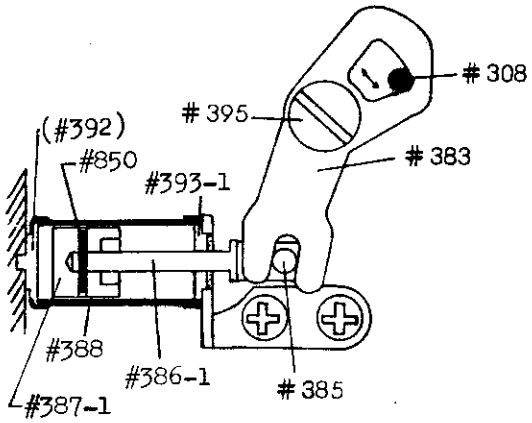
↓

Down lever stopper #878

↓

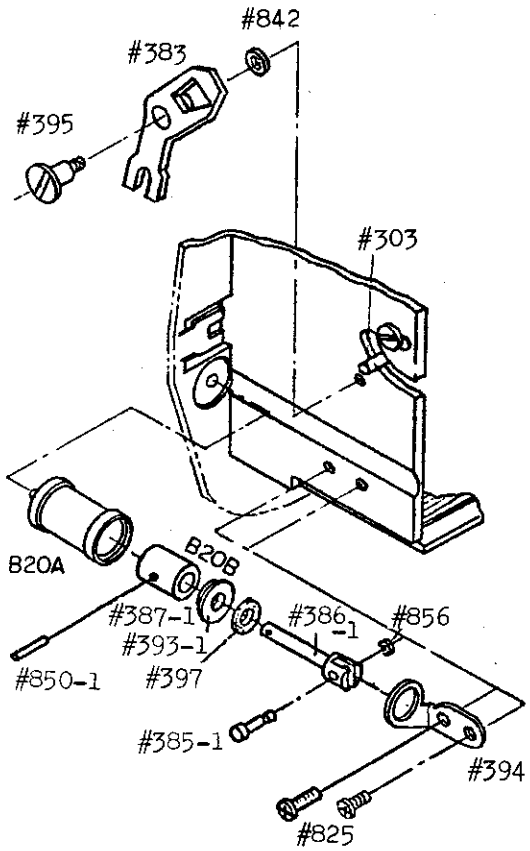
Washer #858, Mirror-down latch lever #330, latch lever axle #291

⑰ Reassembly of air damper



Air damper mechanism

Air damper lever, connected to piston inserted into air damper cylinder, linked to mirror holder, so that impact and sound, caused by up-and-down movement of mirror are reduced.



Front plate (#6)

↓

Air damper, ⊕#825×2

↓

Air damper pin #385-1, washer #842, ⊖#395×1